HARMONY GROVE VILLAGE

APPENDIX F

ACOUSTICAL ASSESSMENT REPORT

VTM 5365; GPA 04-04; MUP 04-012, MUP 04-013, and MUP 04-014;
REZ 04-010; SP 04-03; Log No. 04-08-011; SCH No. 2004071004

for the

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AUGUST 2006

Acoustical Assessment Report

Harmony Grove Village Project
County of San Diego

(VTM 5365; GPA 04-04; MUP 04-012; MUP 04-013; MUP 04-014; REZ 04-010; SP 04-03; LOG NO.04-08-011; SCH # 2004071004)

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INFORMATION FOR THE READER

This technical report contains environmental information related to a number of potential Project element options or design scenarios. Some of these options/design scenarios comprise part of the Proposed Project and are analyzed in the project environmental impact report (EIR). Other options/design scenarios have been retained within the technical report for purposes of environmental documentation (e.g., in case it becomes necessary to rely upon one or more of these options, or elements thereof, in the future as project planning progresses), but are not carried forward into the EIR as outlined below.

In addition to evaluation of Proposed Project facilities and off-site sewer alignments, the following report incorporates discussion of several possible on- and off-site roadway upgrades. Three of the off-site roadway options (A, B and C) are designed to address critical access requirements for the proposed development, with the inclusion of one of these three options mandatory for implementation of the Proposed Project. All three noted roadway options related to critical project access requirements have been retained in this technical study for the reasons noted above, although full discussions of these options are not included in the project EIR. Specifically, only Option B (the extension of new Village Road) comprises part of the Proposed Project in the EIR. Option A (consisting of one scenario of upgrades to Harmony Grove Road) is not being pursued at this time and is not included in the EIR, while Option C (a differing scenario of improvements to Harmony Grove Road) is included in Chapter 5.0 of the EIR as an alternative.

The remaining off-site roadway improvement options involve a number of potential designs to address various speed limit scenarios and development-related impacts along portions of Harmony Grove Road and Country Club Drive. Specifically, this technical report evaluates 30, 35 and 40 mile per hour (mph) roadway design scenarios on the portion of Country Club Drive extending west of a large hill abutting the northern Village boundary and continuing north to Kauana Loa Drive, as well as the potential for roadway design options along the off-site portion of Harmony Grove Road abutting the southeastern site boundary. One or more of the off-site road options for Country Club Drive and Harmony Grove Road could be pursued if the Harmony Grove Village Project is approved, or the Board of Supervisors may decide to reject all of the potential off-site road improvement options.

This technical report also addresses a conservative 40 mph design speed option along on-site portions of Country Club Drive/Village Road (the EIR addresses 30, 35 and 40 mph design scenarios, as appropriate). Finally, this report matches the Project Transportation Impact Analysis in addressing Avenida del Diablo without turn restrictions in initial modeling (Section 5.2.1). An option to place a median on Citracado Parkway to preclude turns onto Avenida del Diablo (thereby reducing traffic volumes on this street) is addressed in Section 6.2 and comprises part of the Proposed Project in the EIR.

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EXECUTIVE SUMMARY

The proposed project is a mixed-use rural residential village consisting of single family residential uses, commercial uses, live/work lots, open space, park and recreational uses, a wastewater reclamation facility and various equestrian facilities including an equestrian ranch for horse boarding and lessons. The project site is located within the Harmony Grove community in the County of San Diego.

Traffic noise along Harmony Grove Road, Country Club Drive and future Village Road would generate noise at the site. The traffic noise at the outdoor noise sensitive areas of the project site could be mitigated with minimum six-foot high sound walls at some of the residential lots adjacent to these roads. Prior to approval of building permits, an interior noise study would be required for the homes on several of the lots to determine the appropriate noise mitigation measures to achieve the County's 45 dB CNEL interior noise criterion.

The project would generate traffic noise along off-site roads and would implement off-site road widening improvements. The noise associated with the project's traffic and proposed road improvements would generate significant noise impacts. The extent of the noise impacts would depend on the off-site road improvement design option selected. An eight-foot high noise barrier at an off-site home would partially mitigate the noise impact at associated with Option A and for one residence associated with Option C. Site-specific noise mitigation studies would be required to evaluate the effectiveness of noise barriers for some of the existing residences along Avenida del Diablo for Option B, and for some residences along Harmony Grove Road for Option C. Noise barriers would not be feasible for some of the homes because the homes have driveways with direct access to these roads. The driveway openings would limit the effectiveness of the noise barriers. Also, there is no guarantee at this time that private property owners or the County Department of Public Works would agree to implementation of sound walls. Thus, the off-site traffic noise impact is considered significant and unmitigated.

An onsite wastewater treatment facility and off-site pump stations could be built. Based on a review of preliminary information, these facilities have the potential to generate noise levels that would exceed the County's noise ordinance criteria. Preliminary noise abatement measures have been identified to mitigate the noise level to 45 dB or less at the adjacent property boundaries. Noise abatement measures would consist of acoustical louvers and/or sound attenuators, sound-rated doors, sound absorbing materials on the walls and ceilings of the buildings, enclosures, silencers, building orientations, selecting relatively quieter equipment and increasing the building setback from the property lines. A noise study should be prepared prior to Major Use Permit final facility design approval to ensure that necessary noise abatement measures are incorporated into the building and site plans.

An equestrian center would be located along the south side of Harmony Grove Road. The equestrian center would use a public address system during up to six horse shows per year. A preliminary design has been identified for the PA system to comply with the County's noise ordinance criteria. Prior to the first show, a noise abatement study, should be provided to the County DPLU that demonstrates that the PA system has been tested and complies with the County's noise ordinance criteria.

Short-term noise impacts would occur during construction activities. Noise impacts associated with on-site construction activities could be mitigated by using quieter, typically smaller equipment, when immediately adjacent to existing off-site homes that would be adjacent to Lots 7, 8, 45, 46 and 69-73. Significant noise impacts associated with off-site road design Options A and C could be mitigated by installing a 12-foot high temporary barrier adjacent to a residence along Harmony Grove Road. However, with Option C construction noise impacts would not be feasible for several homes along Harmony Grove Road between approximately Howard Street and Hale Avenue due to driveway openings. Thus, significant short-term and unmitigated noise impacts would result for some of the off-site residences with Option C.

A short-term noise impact could occur at off-site homes along Avenida del Diablo, between Citracado Parkway and Hale Avenue, and along Hale Avenue between a wastewater treatment facility and Avenida del Diablo. The short-term noise impact at the homes along Avenida del Diablo could be mitigated by constructing a temporary minimum eight-foot high noise barrier along the right-of-way of the homes adjacent to Avenida del Diablo. Noise barriers would not be feasible at the homes along Hale Avenue because the driveway openings to the homes would limit the effectiveness of noise barriers. The noise level would exceed the City's construction noise level criterion when equipment is operating adjacent to the residences (approximately one to two days at each residence), thus resulting in a significant short-term unmitigated noise impact.

1.0 INTRODUCTION

The Harmony Grove Village project would develop a 468-acre site located at the intersection of Harmony Grove Road and Country Club Drive in the County of San Diego *(Figures 1 and 2)*. Harmony Grove Village would be a rural residential community with a small community/commercial core.

This noise report evaluates the noise impacts associated with the Harmony Grove Village project. This noise report evaluates long-term noise impacts associated with traffic at the site and project-generated off-site traffic, operational noise associated with a potential onsite wastewater reclamation facility and off-site pump station, and an equestrian facility. Short-term construction noise impacts are also evaluated. The noise impacts are assessed based on County of San Diego noise criteria. Also, noise impacts are assessed using the City of Escondido's noise criteria where off-site improvements would be located within the City boundaries.

2.0 PROJECT DESCRIPTION

The proposed project is a mixed-use rural residential village consisting of single family residential uses, commercial uses, live/work lots, open space, park and recreational uses, a wastewater reclamation facility and various equestrian facilities including an equestrian ranch for horse boarding and lessons (*Figure 3*). Also, a fire station and church may ultimately be constructed on the site. However, there are no use permits or site plans currently proposed for these uses. Absent specific information about the possible facility, some conservative parameters have been developed as part of the traffic study. An approximately 6,600 square foot four-bay (double-loaded) apparatus facility would accommodate up to eight fire emergency service vehicles. This facility could operate 7 days a week and 24 hours per day.

Construction noise impacts associated with the project that may potentially effect sensitive avian species are discussed in the project's biology report, as well as the Environmental Impact Report prepared for this project (HELIX 2005).

As part of the project, three off-site road improvements options to accommodate projected traffic volumes and two wastewater treatment design options are being considered. The design options are briefly described below.

Off-Site Road Improvement Options

The proposed project would require one of three off-site road improvements to accommodate projected traffic volumes. These off-site road improvements are described as Options A, B and C below.

Option A consists of widening Harmony Grove Road from two to four lanes between the new Village Road, north to the existing intersection of Harmony Grove Road and Kauana Loa Drive. This road improvement would then require a realignment of Harmony Grove Road in a northeast direction and construction of, and connection to, a short segment of Citracado Parkway. Existing Harmony Grove Road would be terminated in a cul-de-sac approximately 350-feet east of the existing Harmony Grove Road/Kauana Loa Drive intersection. Option A would also require

improvements to the intersections of Via Rancho Parkway/Valley Parkway and Andreasen/Auto Parkway.

Option B consists of constructing Village Road from the proposed Village Road/Harmony Grove Road intersection to the proposed Village Road/Citracado Parkway intersection. Option B would also require improvements at the intersection of Via Rancho Parkway/Valley Parkway.

Option C consists of widening Harmony Grove Road, as proposed for Option A, between proposed Village Road north to the existing intersection of Harmony Grove Road and Kauana Loa Drive. From this intersection east, Option C consists of widening existing Harmony Grove Road from two lanes to four lanes until its intersection with Enterprise Street. From this intersection, Option C would require widening Harmony Grove Road from two- to four-lanes between Enterprise Street and Hale Avenue. Like Options A and B, Option C would require improvements at the intersection of Via Rancho Parkway/Valley Parkway.

Wastewater Treatment Options

Wastewater generated by the Harmony Grove Village project is proposed to be treated by one of two design options: 1) treatment at an on-site wastewater reclamation facility; or 2) routing effluent via a new sewer line to the existing Hale Avenue Resource and Recovery Facility (HARRF), located in the City of Escondido. The two design options are generally described below and discussed in more detail in the project's EIR.

Option 1 consists of an onsite wastewater reclamation facility (WRF) that would be located east of Country Club Drive and north of Harmony Grove Road. The on-site reclamation facility would treat, store and dispose of treated effluent. A pump station would be required at the low point within the Village sewerage system, located south of Harmony Grove Road.

Option 2 consists of a connection to HARRF. This option would route the Harmony Grove Village project effluent via a new 8-inch force main and 12-inch gravity line from the proposed project site along Harmony Grove Road to the existing City of Escondido HARRF site via two potential routes. With Option 2a installation of the proposed force main and gravity line would occur within the disturbed road shoulder or road bed and would not encroach into areas outside the road shoulder. Option 2b would extend the pipeline from the on-site pump station along Harmony Grove Road and then head east along off-site road improvement Option B (Village Road extension) until this alignment intersects with Avenida del Diablo. The sewer pipeline would follow Avenida del Diablo east, past Citracado Parkway until it intersects with Hale Avenue and then would head north to the HARRF site. The pump station identified for the proposed project would be required for this sewer service option as well, and would be designed and operated in the same manner. The only difference is that the Option 2 pump station would require two pumps with 30 hp each, versus 40 hp expected with the proposed project. The two lines would extend a maximum of approximately 10,000 linear feet between the proposed on-site pump station and HARRF.

3.0 NOISE CRITERIA

The proposed project is located within the County of San Diego. Also, some of the proposed off-site improvements would be located in the City of Escondido. The County of San Diego noise criteria are used to assess noise impacts associated with on-site development and the project's off-site improvements located in the County. The City of Escondido noise criteria are used to assess noise impacts associated with the project's off-site improvements located within the City.

3.1 County Noise Criteria

The County of San Diego typically describes community noise levels in terms of the Community Noise Equivalent Level (CNEL). CNEL is the average A-weighted sound level during a 24-hour day. It is obtained after adding five decibels (dB) to sound levels in the evening hours (7 p.m. to 10 p.m.) and adding ten dB to the sound levels at night (10 p.m. to 7 a.m.). The five and ten dB penalties are applied to account for increased noise sensitivity during the evening and nighttime hours. The A-weighted scale measures noise levels corresponding to the human hearing frequency response. All sound levels discussed in this report are A-weighted. The acoustical terminology used in this report is defined in *Attachment 1*.

County General Plan Noise Element and Planning Department Noise Criteria

The County has established exterior noise guidelines in the noise element of the County's adopted General Plan (County of San Diego 1980). These guidelines identify compatible exterior noise levels for various land use types. The maximum acceptable exterior noise level for new single family development is 60 dB CNEL. This criterion is applied at the outdoor noise sensitive area. In addition, the County requires that interior noise levels not exceed a CNEL of 45 dB.

Applicable to this project, Part 3 of Policy 4b of the County's Noise Element state that:

If the acoustical study shows that noise levels at any noise sensitive area will exceed CNEL equal to 60 decibels, the development should not be approved unless the following findings are made:

A. Modifications to the development have been or will be made which reduce the exterior noise level below CNEL equal to 60 decibels; or

B. If with current noise abatement technology it is infeasible to reduce exterior CNEL to 60 decibels, then modifications to the development have been or will be made which reduce interior noise below CNEL equal to 45 decibels. Particular attention shall be given to noise sensitive interior spaces such as bedrooms. And,

C. If finding "B" above is made, a further finding is made that there are specifically identified overriding social or economic considerations which warrant approval of the development without modification as described in "A" above.

The County Department of Planning and Land Use also utilizes noise criteria for evaluating off-site noise impacts to residences or noise sensitive areas from project-related traffic. The County considers such impacts to be significant based on the following conditions: (1) A project-related net increase of 10 dB CNEL or more in areas where the existing noise level is less than 50 dB CNEL, (2) A project-related increase that results in the existing noise level exceeding 60 dB CNEL where the existing noise level is between 50 and 58 dB CNEL, or (3) Exceed a three dB CNEL increase where the existing noise level is 59 dB CNEL or greater.

County Noise Ordinance Criteria

The County has adopted a quantitative noise ordinance to control excessive noise generated in the County. The noise ordinance limits are in terms of a one-hour average sound level. The allowable noise limits depend upon the County's zoning district and time of day as shown in *Table 1*. Also, if the measured ambient noise level exceeds the applicable limit noted above, the allowable one-hour average noise levels shall be the ambient noise level.

Table 1

Sound Level Limits

Zone	Applicable Limit One-Hour Average Sound Level (dB)		
	7 a.m. to 7 p.m.	7 p.m. to 10 p.m.	10 p.m. to 7 a.m.
R-S, RD, R-R, R-HM, A-70, A-72, S-80, S-81, S-87, S-88, S-90, S-92, R-V, and R-U use regulations with a density of less than 11 dwelling units per acre	50	50	45
R-RO, R-C, R-M, C-30, S-86, R-V, R-U and V5 use regulations with a density of 11 or more dwelling units per acre	55	55	50
S-94, V4 and all other commercial zones	60	60	55
V1	60	55	55
V2	60	55	50
V3	70	70	65
M50, M52, M54	70	70	70
S-82, —58, and all other industrial zones	75	75	75

Notes:

If the measured ambient level exceeds the applicable limit noted above, the allowable one-hour average sound level will be the ambient noise level. The ambient noise level will be measured when the alleged noise violation source is not operating.

The sound level limit at a location on a boundary between two zoning districts is the arithmetic mean of the respective limits for the two districts; provided however, that the one-hour average sound level limit applicable to extractive industries including but not limited to borrow pits and mines, will be 75 dB at the property line regardless of the zone where the extractive industry is actually located.

Construction noise is also governed by the County's noise ordinance (County of San Diego 2005). Specifically, it shall be unlawful to operate any construction equipment so as to cause at or beyond the property line of any property upon which a legal dwelling unit is located an average sound level greater than 75 dB between the hours of 7:00 a.m. through 7:00 p.m., Monday through Saturday excluding legal holidays. The County interprets the average sound level to mean the one-hour average sound level.

3.2 City of Escondido Noise Criteria

City General Plan Noise Element

The project proposes off-site improvements that would affect residents located in the City of Escondido. The City's General Plan Noise Element contains noise policies applicable to this project (City of Escondido 1990). Policy E1.2 states that the goal for the outdoor noise level in residential areas is a CNEL of 60 dB or less. However, it is recognized that a CNEL of 60 dB or less may not be achieved in all residential areas within the realm of economic or aesthetic feasibility. Policy E1.4 states that projects which increase noise levels by five dB or more should be considered as generating a significant noise impact and should require mitigation.

City Noise Ordinance Criteria

The City also regulates noise associated with construction activities. Construction is permitted between the hours of 7:00 a.m. to 6:00 p.m. Monday through Friday and from 9:00 a.m. to 5:00 p.m. on Saturdays. Also, construction noise is not to exceed a one-hour average sound level of 75 dB.

3.3 U.S. Fish and Wildlife Noise Criteria

Construction noise criteria and impacts associated with the project that may potentially effect sensitive avian species are discussed in the project's biology report, as well as the Environmental Impact Report prepared for this project (HELIX 2005).

4.0 EXISTING CONDITIONS

The primary existing noise source at the site is traffic along Country Club Drive and Harmony Grove Road. The existing traffic volume is approximately 1,500 average daily traffic (ADT) along Country Club Drive (LLG 2006). Harmony Grove Road has an existing traffic volume of approximately 5,400 ADT.

4.1 Ambient Noise Monitoring

Noise measurements were conducted at the project site and nearby area to determine the existing noise level. The measurements were made using a calibrated Larson-Davis Laboratories Model 700 (S.N. 2132) integrating sound level meter equipped with a Type 2551 ½-inch pre-polarized condenser microphone with pre-amplifier. When equipped with this microphone, the sound level meter meets the current American National Standards Institute standard for a Type 1 precision

sound level meter. The sound level meter was positioned at a height of approximately five-feet above the ground.

Noise measurements were conducted at on June 1, 2004 and December 14, 2004. The noise measurement locations are depicted as Sites 1-6 on *Figure 4*. The noise measurement locations had a direct line-of-sight view to the adjacent roads. The measured average noise levels at the sites ranged from 47 dB to 66 dB and are shown in *Table 2* with the concurrent traffic volumes. As noted, the measured noise levels are in terms of the average sound level during the noise measurement period. This is different than the modeled CNEL noise levels discussed below and previously defined in Section 3.1.

Table 2

Measured Noise Levels and Traffic Volumes

Site	Description	Date Time	L_{eq}[1]	L_{eq}[2]	Cars	MT[3]	HT[4]
1	40' to center line of Country Club Dr.	6/1/04 2:35 to 3:05 p.m.	64	64	108	6	2
2	35' to center line of Kauana Loa Dr.	6/1/04 1:15 to 1:45 p.m.	61	61	59	1	2
3	40' to center line of Harmony Grove Rd.	6/1/04 1:55 to 2:25 p.m.	64	65	111	3	6
4	50' to center line of Harmony Grove Rd.	12/14/04 10:45 to 11:15 a.m.	63	63	87	2	3
5	35' to center line of Harmony Grove Rd.	12/14/04 12:00 to 12:20 p.m.	66	67	207	3	1
6	Western terminus of Avenida del Diablo	12/14/04 11:30 to 11:50 a.m.	47		-	-	-

Notes: [1] Equivalent Continuous Sound Level (Measured)
[2] Equivalent Continuous Sound Level (Modeled)
[3] Medium Trucks
[4] Heavy Trucks
Temperature 80 degrees, relative humidity 40%, wind 7 mph west, clear sky (6/1/04)
Temperature 76 degrees, relative humidity 30%, wind 3 mph west, clear sky (12/14/04)

4.2 Noise Modeling

The existing CNEL was calculated for Sites 1-5 based on the current traffic volume along the roads using Caltrans' SOUND32 noise model. The same traffic volume and vehicle composition ratios counted during the noise measurements were used to calibrate the model and verify the input used in the noise model. The modeled noise levels are within one dB of the measured noise levels, which generally confirms the input used for the noise model. The modeled existing traffic speeds were 45 mph along Country Club Drive and 40 mph along Harmony Grove Road and Kauana Loa Drive. The existing truck mix used along the roads to determine the CNEL was assumed to be 5.7 percent medium trucks and 3.2 percent heavy trucks. This truck mix is based on vehicle mix surveys conducted along Harmony Grove Road and Country Club Drive on May 4, 2005 between 11:30 a.m. and 1:30 p.m. The truck percentage was slightly higher on Harmony Grove Road. This truck percentage is used for all the modeled roads in this area. It should be noted that truck weight restrictions are in place for Harmony Grove Road and Country Club Drive. Traffic signs are posted for these roads in this area noting that the maximum vehicle weight is restricted to seven tons or less.

The modeled existing CNEL is approximately 66 dB at Site 1 and 61 dB at Site 2, 66 dB at Site 3, 65 dB at Site 4 and 69 dB CNEL at Site 5. Noise modeling results are included in *Attachment 2*. Noise modeling was not performed for Site 6 because the noise measurement site is at the western terminus of Avenida del Diablo, thus, there is no through traffic.

5.0 FUTURE CONDITIONS

Traffic noise along Harmony Grove Road, Country Club Drive and Village Road would generate noise at some of the proposed on-site residential lots. Also, the project would generate long-term operational noise and short-term construction noise. Long-term noise associated with the project would include noise from additional project-generated traffic on nearby roads, the wastewater reclamation facility and an equestrian facility. Short-term noise associated with the project would include construction activities at the project site, as well as off-site pipelines and off-site road improvements.

5.1 On-site Traffic Noise Impact

Harmony Grove Road, Country Club Drive and Village Road would be the primary traffic noise sources in the future. Adjacent to the project site, the future year 2030 traffic volume would be the same for all traffic options (i.e., Options A-C) and would range up to approximately 8,000 ADT along Harmony Grove Road (LLG 2006). The future year 2030 traffic volume would range up to 10,000 ADT along Country Club Drive south of Village Road and 7,500 ADT north of Village Road (LLG 2006). The future year 2030 traffic volume would be approximately 6,500 ADT along Village Road.

The future CNEL was calculated for the residential lots based on the future year 2030 traffic volume along Harmony Grove Road, Country Club Drive and Village Road using Caltrans' SOUND32 noise model. Harmony Grove Road is proposed to be constructed as a town collector road adjacent to the site. Country Club Drive and Village Road are proposed to be Rural Light Collector roads adjacent to the site. The modeled future traffic speeds were 40 mph along Harmony Grove Road, and 30 mph along on-site portions of Country Club Drive and Village

Road in accordance with the project tentative map. These are the design speeds for the roads adjacent to the project site. (Alternative design speed modeling also was undertaken. Please refer to Section 7.0 of this report.) The future truck mix used along these roads is assumed to be 5.7 percent medium trucks and 3.2 percent heavy trucks.

Exterior Noise

The vesting tentative map indicates that several lots would be adjacent to Harmony Grove Road, Country Club Drive and Village Road. Some of the lots would be shielded by intervening topography. Other lots would have a direct exposure to traffic noise from the roads. The future unmitigated 60 dB CNEL noise contour would be located approximately 340 feet from the center line of Harmony Grove Road, up to 300 feet from the center line of Country Club Drive and 200 feet from the center line of Village Road assuming a hard site condition and no intervening topography.

The future noise level would exceed 60 dB CNEL at Lots 224-227adjacent to Harmony Grove Road, Lots 236, 237, 243-248, 425-427, 554, 569, 575, 581, 587, 593, 599, 600, 605, 606, 610 and 633 adjacent to Country Club Drive and Lots 616, 623, 638, 643 and 647-650 adjacent to Village Road. If not mitigated, the noise level would result in a significant noise impact. Several of the lots such as and Lots 555-562, 630 and 631 are located below the road elevation of County Club Drive. The grade elevation difference between the road and lots would result in the edge of the road providing shielding that would reduce the noise level to 60 dB CNEL or less at the first floor level of these lots.

An alternative use at the proposed WRF site is residential development. If residences are developed at this site Lots 660-664 will also exceed 60 dB CNEL.

Interior Noise Impact

The County requires that interior noise levels not exceed a CNEL of 45 dB. Typically, with the windows open, building shells provide approximately 15 dB of noise reduction. Therefore, rooms exposed to an exterior CNEL greater than 60 dB could result in an interior CNEL greater than 45 dB. The exterior noise level would exceed 60 dB CNEL at the first or second floor level of Lots 224-227, 236, 237, 242-248, 425-427, 554-562, 564, 569, 570, 575, 576, 581, 587, 593, 599, 600, 605, 606, 610, 611, 616, 623, 624, 630-633, 638, 639, 643 and 647-650. Also, Lots 660-664 will also exceed 60 dB CNEL at the second floor level if the alternative residential development occurs at the proposed WRF site.

5.2 Off-Site Traffic Noise Impact

The project would ultimately generate a traffic volume of approximately 9,290 ADT (LLG 2006). The majority of the traffic would travel along Country Club Drive and Harmony Grove Road as well as other roads in the area. The project would require one of three off-site road improvements to accommodate projected traffic volumes (Options A, B and C). These options could redistribute the traffic in the area. Therefore, the project would generate off-site traffic noise impacts associated with (1) additional traffic volume and the redistribution of traffic along existing roads and (2) additional traffic and physical off-site road improvements.

5.2.1 Existing Plus Project Noise Impacts

Option A

With the exception of County Club Drive and Harmony Grove Road the additional traffic would increase the noise level along the adjacent roads by three dB or less. The project-generated traffic volume would increase the existing noise level by approximately four dB along Country Club Drive between Kauana Loa Drive and the project site, and along Harmony Grove Road between Kauana Loa Road and Village Road. The existing plus project noise level increase associated with the additional traffic volume is depicted in *Table 3*. The traffic noise level increase is, therefore, considered potentially significant for these road segments. A significant noise impact would occur at existing homes that have exterior noise sensitive uses that would be exposed to a significant noise level increase based on the County's significance criteria for project-related noise impacts at off-site noise sensitive areas. Based on a preliminary review, the backyard areas are physically shielded by the homes and there are no outdoor noise sensitive areas (i.e., either backyards or house facades) at residences along Country Club Drive that would be exposed to a significant noise impact. The noise impact along Harmony Grove Road is discussed below.

The noise effect associated with the project's traffic volume increase has been described above. In addition, with this option the project would widen Harmony Grove Road between future Village Road and Kauana Loa Drive from two to four lanes. Also, Harmony Grove Road would be realigned at the intersection with Kauana Loa Drive. Widening with this option would not substantially increase the noise level beyond the traffic noise level increase previously shown in *Table 4* at most of the homes. However, the road would be realigned closer to one home near the intersection of Harmony Grove Road and Kauana Loa Drive. This existing plus project noise level increase would result in a significant noise impact at the home located at the southwest intersection of Harmony Grove Road and Kauana Loa Drive because the noise level would increase by approximately 12 dB CNEL and would reach approximately 67 dB CNEL at the backyard of the home and 65 dB CNEL at the front of the home. The existing plus project noise level increase at the remaining homes would not exceed the County's significance criteria, thus, resulting in a less than significant noise impact.

There are no noise sensitive receivers at the Andreasen Drive/Auto Parkway intersection. Also, there are no noise sensitive receivers directly adjacent to the proposed project road improvements at Via Rancho Parkway and Valley Parkway. Thus, the noise impacts associated with these proposed project improvements would be less than significant.

Table 3
Off-Site Traffic Volume Noise Level Increase
(Existing Plus Project)

Street (Segment)	Existing ADT	Existing + Project ADT (Option A)	Existing + Project ADT (Option B)	Existing + Project ADT (Option C)	CNEL Difference[1] (dB) (Option A)	CNEL Differnce[1] (dB) (Option B)	CNEL Difference[1] (dB) (Option C)
Country Club Drive							
Vineyard Ave. to Kauana Loa Dr.	3,700	6,020	6,020	6,020	2	2	2
Kauana Loa Dr. to Project Site	1,500	3,540	4,040	3,540	**4**[2,3]	**4**[2]	**4**[2,3]
Harmony Grove Road							
Hale Ave. to Howard Ave.	9,000	8,460	6,630	12,900	0	-1	2[3]
Howard Ave. to Enterprise St.	8,700	10,320	6,700	13,070	1	-1	2[3]
Enterprise St. to Kauana Loa Dr.	7,000	13,220	7,310	13,220	3	0	3
Kauana Loa Dr. to Village Rd.	5,100	11,600	5,890	11,600	**4**[2,3]	1	**4**[2,3]
Village Rd. to Country Club	5,100	7,240	7,510	7,240	2	2	2
Country Club Dr. To Wilgen Rd.	5,400	8,190	8,370	8,190	2	2	2
West of Wilgen Rd.	5,100	5,840	5,840	5,840	1	1	1
Kauana Loa Dr.							
Country Club Dr. to Harmony Grove	1,300	1,580	1,080	1,580	1	-1	1
Village Rd.							
Harmony Grove to Citracado Pkwy.	0	0	8,220	0	0	NA	0
Avenida Del Diablo							
Citracado Pkwy. to Hale Ave.	2,700	3,350	7,640	3,350	1	**5**[4]	1
Hale Ave. to Valley Pkwy.	1,100	1,840	5,190	1,840	2	**7**[4]	2
Citracado Parkway							
Avenida Del Diablo to Valley Pkwy.	2,400	3,050	5,580	3,050	1	4	1
Hale Avenue							
9th Ave. to Harmony Grove Rd.	7,100	6,280	7,110	8,680	0	0	1
Harmony Grove Rd. to Ave. del Diablo	4,800	6,190	3,740	6,190	1	-1	1

Notes:
[1]Existing vs. existing plus project
Bold[2] = exceeds County's 3 dB significance threshold
[3] Also see the Option A and C text in this section for additional discussion
Bold[4] = exceeds City of Escondido's 5 dB significance threshold
NA = Not applicable because this segment of road does not exist, please see the Option B text for discussion
All values are rounded to the nearest dB

Option B

The project-generated traffic volume would increase the existing noise level by four dB along Country Club Drive from Kauana Loa Drive to the project site. This noise level increase would exceed the County's noise significance threshold. The project-generate traffic volume would be approximately five to seven dB along Avenida del Diablo from Citracado Parkway to Valley Parkway. This noise level increase would exceed the City's noise significance threshold. The remaining road segments would comply with the local jurisdiction's noise significance thresholds. Based on a preliminary review, therefore, no residences along Country Club Drive would have outdoor noise sensitive areas (i.e., either backyards or house facades) exposed to a significant noise impact, but approximately 40 existing homes and a mobile home park along Avenida del Diablo would be exposed to a significant noise increase.

Also, with this option Village Road would be constructed between Harmony Grove Road and future Citracado Parkway. The closest noise sensitive area of an existing home would be located approximately 300 feet from the center line of the Village Road between Harmony Grove Road and future Citracado Parkway. At this distance, the existing plus project traffic (i.e., 8,220 ADT) would generate a noise level of approximately 50 dB CNEL. This noise level would result in a less than significant noise level increase. Also, the noise level would not exceed the City's or County's 60 dB CNEL noise criteria.

Option C

This option would result in similar noise impacts as described for Option A along Harmony Grove between future Village Road and Kauana Loa Drive, along Country Club Drive between Kauana Loa Drive to the project site, as well as at the Via Rancho Parkway/Valley Parkway intersection. This option would also widen Harmony Grove Road between Enterprise Street and Hale Avenue from two to four lanes in the City of Escondido. In addition to the two dB CNEL increase associated with the additional project traffic volume shown in Table 4, the road improvements would increase the noise level by widening the road closer to the existing homes. The existing plus project increase associated with both the widening and additional traffic volume would be three dB between Hale Avenue and Enterprise Street. The existing plus project noise level would not exceed the City's five dB significance threshold. Thus, the existing plus project noise impact is less than significant.

5.2.2 Near-Term Cumulative Noise Impacts

Option A

The near term cumulative traffic noise impact is potentially significant along Country Club Drive between Kauana Loa Drive and the project site. Also, along Harmony Grove Road from Enterprise Street to Village Road the additional traffic would increase the noise level by more than three dB. The project's contribution to the near-term cumulative noise level increase would be more than one dB on these roads and more than 49% of the noise level increase. The project's portion of the cumulative noise impact is cumulatively considerable. The near-term cumulative noise level increases associated with the additional traffic volumes are depicted in *Table 4*. Based on a preliminary review, there are no homes along Country Club Drive or along Harmony Grove Road from Enterprise to Kauana Loa Drive having backyards, or building facades that would be exposed to a significant noise impact.

Table 4
Off-Site Traffic Volume Noise Level Increase
(Near-Term Cumulative)

Street (Segment)	Existing ADT	Existing + Project + Cumulative ADT (Option A)	Existing + Project + Cumulative ADT (Option B)	Existing + Project + Cumulative ADT (Option C)	CNEL Difference[1] (dB) (Option A)	CNEL Differnce[1] (dB) (Option B)	CNEL Difference[1] (dB) (Option C)
Country Club Drive							
Vineyard Ave. to Kauana Loa Dr.	3,700	6,850	6,850	6,850	3 (2)	3 (2)	3 (2)
Kauana Loa Dr. to Project Site	1,500	4,370	4,870	4,370	**5 (3)[2,3]**(59%)	**5 (3)[2]**(63%)	**5 (3)[2,3]**(59%)
Harmony Grove Road							
Hale Ave. to Howard Ave.	9,000	16,400	14,570	20,840	3 (0)	2 (0)	4 (1)[3]
Howard Ave. to Enterprise St.	8,700	19,290	15,670	22,040	4 (0)	3 (0)	4 (1)[3]
Enterprise St. to Kauana Loa Dr.	7,000	16,880	10,970	16,880	**4 (2)**	2 (0)	**4 (2)**
Kauana Loa Dr. to Village Rd.	5,100	15,480	9,770	15,480	**5 (2)[2]** (49%)	3 (0)	5 (2)[2] (49%)
Village Rd. to Country Club Dr.	5,100	10,410	10,680	10,410	3 (1)	3 (1)	3 (1)
Country Club Dr. to Wilgen Rd.	5,400	11,300	11,480	11,300	3 (1)	3 (1)	3 (1)
West of Wilgen Rd.	5,100	8,950	8,950	8,950	2 (0)	2 (0)	2 (0)
Kauana Loa Dr.							
Country Club Dr. to Harmony Grove	1,300	2,110	1,610	2,110	2 (1)	1 (0)	2 (1)
Village Rd.							
Harmony Grove to Citracado Pkwy.	0	0	10,220	0	0	NA	0
Avenida Del Diablo							
Citracado Pkwy. to Hale Ave.	2,700	3,790	8,080	3,790	2 (1)	**5 (4)[4]** (86%)	2 (1)
Hale Ave. to Valley Pkwy.	1,100	2,450	5,800	2,450	4 (2)	**7 (5)[4]** (73%)	4 (2)
Citracado Parkway							
Avenida Del Diablo to Valley Pkwy.	2,400	3,490	6,020	3,280	2 (1)(55%)	4 (3)(82%)	1 (1)
Hale Avenue							
9th Ave. to Harmony Grove Rd.	7,100	11,440	12,270	13,750	2 (0)	2 (0)	3 (1)
Harmony Grove Rd. to Ave. del Diablo	4,800	7,970	5,520	7,620	2 (1)	1 (0)	2 (1)

Notes:
[1]Existing vs. existing plus project plus near term cumulative
Bold[2] = exceeds County's 3 dB significance threshold
[3] Also see the Option A and Option C text in this section for additional discussion
Bold[4] = exceeds City of Escondido's 5 dB significance threshold
6(3)(75%) = total noise level increase (project's portion of the total noise level increase) (project's percentage of contribution)
NA = Not applicable because this segment of road does not exist, please see the Option B text for discussion
All values are rounded to the nearest dB

Widening of Harmony Grove Road with this option would not substantially increase the noise level beyond the traffic noise level increase associated with the additional traffic volume shown in *Table 5* at most of the homes. However, the road would be realigned closer to one home near the intersection of Harmony Grove Road and Kauana Loa Drive. This near-term noise level increase would result in a significant noise impact at the home located at the southwest intersection of Harmony Grove Road and Kauana Loa Drive because the noise level would increase by approximately nine dB CNEL and would reach approximately 68 dB CNEL at the backyard of the home and front house facade. The noise level increase at the remaining homes would result in less than significant noise impacts.

There are no noise sensitive receivers at the Andreasen Drive/Auto Parkway intersection. Also, there are no noise sensitive receivers directly adjacent to the proposed project road improvements at Via Rancho Parkway and Valley Parkway. Thus, the noise impacts associated with these proposed project improvements would be less than significant.

Option B

The near term cumulative traffic noise impact is potentially significant along Country Club Drive between Kauana Loa Drive and the project site. The additional traffic would increase the noise by more than three dB. The project's contribution to the near term cumulative noise level increase would be more than one dB on this road. Also, the near term cumulative traffic noise level would increase by five dB or more along Avenida del Diablo from Citracado Parkway to Valley Parkway. This noise level increase would exceed the City's significance threshold. The project's portion of the cumulative noise impact is cumulatively considerable. Based on preliminary review, there are no residences having outdoor noise sensitive areas (i.e., either backyards or house facades) along Country Club Drive that would be exposed to a significant noise impact, but approximately 40 homes and a mobile home park along Avenida del Diablo would be exposed to a significant noise increase. The noise level increase would be four dB along Citracado Parkway between Avenida del Diablo and Valley Parkway. This noise level would not exceed the City's noise threshold of five dB.

Also, the proposed Village Road near-term cumulative traffic (i.e., 10,220 ADT) between Harmony Grove Road and future Citracado Parkway would generate a noise level of approximately 51 dB CNEL at the closest noise sensitive area of an existing home. This noise level would result in a less than significant noise level increase. Also, the noise level would not exceed the City's or County's 60 dB CNEL noise criteria.

Option C

This option would result in similar noise impacts as described for Option A along Harmony Grove between future Village Road and Enterprise Street as well as at the Via Rancho Parkway/Valley Parkway intersection.

In addition to the three to four dB CNEL increase associated with the additional near term cumulative project traffic volume along Harmony Grove Road between Hale Avenue and Enterprise Street shown in Table 4, the road improvements would increase the noise level by widening the road closer to the existing homes. The near term cumulative traffic increase associated with both the widening and additional traffic volume would be six dB between Hale Avenue and Enterprise Street. The near term cumulative noise level would exceed the City's five dB significance threshold. Thus, the project would contribute to a cumulative significant noise impact. The project's portion is considered cumulatively considerable and requires evaluation of noise mitigation measures.

5.3 Wastewater Treatment Noise

Wastewater generated by the Harmony Grove Village project is proposed to be treated by one of two design options. These facilities would contain mechanical equipment that would generate noise. The noise impacts associated with these two design options are described as follows.

5.3.1 Option 1 - On-site Wastewater Reclamation Facility

The proposed on-site WRF design option would construct a wastewater treatment plant with a design capacity of approximately 230,000 gallons per day near the northeast intersection of Country Club Drive and Harmony Grove Road. This proposed facility would be operated by either a County Sanitation District or a California Water District which would have to be formed to own and operate the facility. A conceptual design plan has been prepared that indicates the facility components would consist of a process area, control building, a dewatering and equipment building, effluent storage area, emergency storage area and pump station. Also, a pump station would be located along the south side of Harmony Grove Road west of Country Club Drive. Noise generating equipment at the facility is described below. To determine the noise level that would be produced by the Harmony Grove Village WRF, a noise level comparison of a similar, but larger facility was conducted based on noise measurements at the Santa Fe Valley WRF. Based on conversations with the Harmony Grove WRF design engineer, the existing Santa Fe Valley WRF and the proposed Harmony Grove Village WRF have similar design components (Dexter Wilson Engineering 2005). The Santa Fe Valley WRF has a current design capacity of approximately 485,000 gallons per day. The equipment source sound levels used in this report were based on noise measurements conducted at the Santa Fe Valley Treatment Plant during operation in January 2005. Because the capacity of the Santa Fe Valley WRF is approximately two times larger than the proposed Harmony Grove Village WR, the measured noise levels could be greater than at the proposed facility. A list of noise-generating mechanical equipment at each facility component, manufacturers' specifications, ventilation requirements, as appropriate, are provided in *Attachment 3*.

Process Area

The process area would consist of a concrete cast-in-place, uncovered partly buried outdoor structure. The structure will include aeration basins, clarifiers, flow equalization and aerobic digester. Also, headworks equipment would be located at the process area and would include a rotary screen powered by a small motor. This group of equipment would generate a noise level of up to approximately 50 dB at a distance of 25 feet.

Control/Operations Building

This would be in a concrete building that includes an air compressor room and approximate 200 kW standby diesel generator room (Dexter Wilson Engineering 2005). Also, the building could contain an odor control facility that would have approximately four fans, and two approximate10 HP pumps for the plant water system. The odor control facility may also be located within the dewatering and equipment building. Excluding the generator set, this group of equipment would generate a noise level of approximately 62 dB at a distance of 25 feet.

To determine the noise level that would be produced by the generator set, noise measurements were conducted for a similar design (within a building) with a larger standby diesel generator (i.e., 350 kW). The generator is located inside a masonry block building; two sides of the building have louver openings. The measured noise level ranged up to 77 dB at a distance of 25 feet from the building. The noise level was more than 25 dB less on the quieter side of the building without the louver openings.

Dewatering and Equipment Building

This would be a concrete building with a centrifuge, and two (one is standby) sludge variable speed drive pumps, and some blowers. This group of equipment would generate a noise level of up to approximately 65 dB at a distance of 25 feet. Also, as previously indicated the odor control facility may be located within this facility component.

Effluent/Emergency Storage Area

This component would consist of a below grade covered concrete structure. There would be no substantial noise sources associated with this facility component.

Wet Weather Storage Area

This component would consist of an uncovered outdoor basin. There would be no substantial noise sources associated with this facility component.

Pump Station

An underground covered pump station would be located at the WRF site. The exact location has not been determined. The pump station would include two submersible pumps that would not generate substantial noise. Based on a similar underground pump station, the pumps would generate a noise level of 45 dB at a distance of 15 feet from the access hatch.

Cumulative Operations Noise Impact

The noise levels associated with the operations at the future Harmony Grove Village facility have been calculated based on the conceptual layout and noise measurements conducted at a facility with similar components and larger capacity than would be planned for Harmony Grove Village (i.e., Santa Fe Valley WRF). The Harmony Grove Village project site is proposed to be rezoned to S-88. With this zoning, the applicable noise level limits require that the hourly average sound level not exceed 50 dB between the hours of 7:00 a.m. to 10:00 p.m., and 45 dB between the hours of 10:00 p.m. to 7:00 a.m. at or beyond the facility property lines. Assuming the facility components are similar to the Santa Fe Valley WRF and are designed with the worst-case direction (i.e., the loudest side of the facility component) oriented toward the closest property boundary, the noise level would be approximately 58 dB at the northern property boundary, 55 dB at the eastern property boundary, 53 dB at the southern property boundary and 61 dB at the western property boundary. These noise levels would exceed the County's noise ordinance criteria by up to 16 dB. With the quietest side (i.e., generally the solid wall side of the buildings) facing the closest property boundary the noise level would be 39 dB or less. This noise level would comply with the County's noise criteria. Therefore, the noise level at the property line would depend on the orientation of the building and design and type of any duct work, sound attenuators, louvers, doors and other building materials and features. The results of the preliminary calculations are provided in *Attachment 3.*

On-site Pump Station

A pump station would be located along the south side of Harmony Grove Road approximately 500 feet west of Country Club Drive. The pump station would consist of underground pumps and a generator building. Based on the preliminary building design plan the proposed generator building would be a 12-inch thick masonry block building with a 6-inch thick concrete slab roof. The building would have an intake air louver, engine exhaust louver, exhaust fan and a roll-up door. It is anticipated that there would be two underground pumps with 40-HP motors, and an Onan Model 100 DGDB 100 kW emergency generator within the generator building (Dexter Wilson Engineering 2005).

To determine the noise level associated with the underground pumps, noise measurements were made on June 22, 2005 at the La Orilla Pump Station located along the 16000 block of El Camino Real near Solana Beach. This facility would be similar to the proposed pump station because it has an underground pump station and the equipment at the existing La Orilla pump station would also be similar to the proposed facility, although the pumps are American 20-HP at the existing facility. Therefore, to account for the equipment size differences, an adjustment of three dB was added to the measured pump noise level. The adjustment to the pump noise is based on a theoretical calculation due to the increase in horse power. Based on the measured noise levels at the existing pump station, the proposed underground pumps would generate an average noise level of 45 dB at 15 feet from the hatch entrance to the underground pumps. The Onan generator has a manufacturer's sound rating of 86 dB with the exhaust isolated. There is no rating for the exhaust noise. However, based on the exhaust rating for an Onan 600 kW generator, which is the closest in size with available information to the proposed generator, an open exhaust (no muffler) would be approximately 113 dB or less at three feet.

Based on a review of the preliminary information, and assuming the pump station building is setback a distance of 10-feet from the property lines, and a critical grade engine muffler is installed, it is anticipated that the noise level would range from 55 to 79 dB at the properties lines due to noise from the generator. This noise level would exceed the County's noise ordinance criteria by up to 34 dB. However, this noise level would be at a parking lot and not a noise sensitive area such as a residence. The closest residence to the pump station would be located approximately 325 feet to the north. Outdoor use areas at the nearby park would be located approximately 250 feet from the pump station. At these locations the generator noise would range up to approximately 49 dB at the closest residences and 51 dB at the outdoor use areas of the park. The underground pumps would comply with the County's noise criteria assuming the entrance hatch is setback at least 15-feet from the property lines.

5.3.3 Option 2 – Connection to Hale Avenue Resource and Recovery Facility (HARRF)

The pump station identified for the proposed project under Option 1 would be required for this sewer service option as well and would be designed and operated in the same manner. The only difference is that the Option 2 pump station would most likely require two pumps each with 30-HP motors. The noise impact associated with this option would be similar to that described for Option 1 (as described for the pump station only).

5.4 Equestrian Center Noise

Three equestrian facilities are proposed within Harmony Grove Village: the private equestrian ranch located south of Harmony Grove Road, an equestrian park within Village Center area and a 2-acre equestrian facility within Planning Area 2.

The equestrian ranch is proposed to accommodate up to 80 horses for boarding and training and would include the following land uses: grass pasture, grass field, schooling ring, hunter ring, dressage arena, mare motel, main barn, dirt paddocks, hot walker and show arena. Hours of operation would be limited to daylight hours.

It is anticipated that approximately six times per year, the equestrian ranch would host a horse show for up to 120 horses for each show, in addition to the 80 horses boarded on-site. Activities associated with the shows would begin around 5:30 a.m. when some of the horses would be groomed, unloaded from trailers and prepared for the shows. The shows would start no earlier than 7:30 a.m. and end by sunset. The shows are expected to last approximately three-days over the weekend. Based on preliminary design information there would be a total of five speakers used at the site. There would be one speaker for each of the two show arenas and three speakers at the main barn. The speakers would be either Radio Shack Model 40-1439 or 40-1440. These speakers have a maximum sound rating of 104 dB and 102 dB at three feet, respectively. The location, height, orientation of the speakers have not been determined. Therefore, for the purpose of this analysis it is assumed worst-case that the speakers are oriented to the closest property line. The closest property line is located approximately 150 feet east of the show arenas.

At full amplification the speakers would generate a maximum noise level of 71 dB at the eastern property line. It should be emphasized that this is a worst-case noise level. Sounds from speakers are very directional, therefore, noise measurements were conducted of the Model 40-1439 speaker. Based on the noise measurements it was determined that the speaker noise levels at the sides and back of the speaker are approximately 13 to 15 dB less than at the front. The one-hour average noise level would depend on the amount of time that the speaker is in use. The PA system would be used for announcement purposes only and would not be used to play music. The announcements that are made would include a rider's name, number and horse name before their ride and then a score after the ride is completed. After an entire class of riders have finished their courses there would be an announcement of the placings for the class. Then it starts again with the announcement of the upcoming class. Also, the announcing is kept to a minimum as an important safety factor because if the announcing is loud or too often it upsets the horses and could cause an accident.

Based on other similar horse show events, the PA system would typically be used for approximately 10 minutes per hour. The remaining time the riders are performing or there are no announcements. Thus, the one-hour average sound level would be approximately 63 dB at the closest property line. Without mitigation this noise level would exceed the County's noise ordinance criteria. A mitigation measure is included in Section 5.5 to demonstrate that the PA system could be designed to comply with the County's noise ordinance criteria (i.e., one-hour average noise level of 50 dB) at the property boundaries.

Additional noise sources would include manure disposal and vehicles parking on-site, particularly during the shows. Manure will be removed twice a week from a commercial roll-off bin located east of the main barn and south of the grass pastures, more than 200 feet from the closest property line. This activity would only last for a few minutes and would not generate significant noise. Up to 350 people (i.e., visitors, horse show participants, judges, employees, etc.), would attend the horse shows. People at the shows would arrive over an approximate five hour period, and it is anticipated that there would be 28 peak hour trips during the horse shows (New Urban West 2005). The horse show parking would be at the grass field located along the south portion of the site. There are no existing residences near the parking area. The vehicles parking in the grass field would not generate significant noise at the adjacent property lines and noise generated at the parking facility would be less than the ambient noise level generated by the vehicles traveling off-site along Country Club Drive. No significant noise impacts would occur from these activities.

5.5 Fire Station, Church, Tack and Feed Store or School Noise

A fire station and church, tack and feed store, or school may be constructed at the site. The fire station may be constructed on Lot 656 and the other uses on Lot 657. The fire station may be mitigation for a significant public services impact identified as part of the Harmony Grove Village environmental review. There are no use permits or site plans currently proposed for these uses. Typically, noise associated with fire stations results from the intermittent use of sirens and standby emergency generators and outdoor mechanical equipment (i.e., air-conditioning units, exhaust fans, etc.). Noise associated with churches generally results from outdoor mechanical equipment, vehicles in the parking lot. Noise associated with outdoor activities would occur at the school or at the church if a school is included. Noise associated with a tack and feed store would most likely result from store deliveries and outdoor mechanical equipment. Noise levels associated with outdoor equipment can exceed 80 dB at three feet. Thus, significant noise impacts would result at the adjacent properties unless adequate mitigation measures are implemented. Detailed noise studies will be required for these uses prior to approval of use permits.

5.6 Construction Noise

The noise levels generated by construction equipment would vary greatly depending upon factors such as the type and specific model of the equipment, the operation being performed and the condition of the equipment. The average sound level of the construction activity also depends upon the amount of time that the equipment operates and the intensity of the construction during the time period. Construction activities would occur during the County's allowable hours of operation.

Construction would involve several phases including clearing and grubbing, grading, foundation construction and finish construction. The maximum noise level ranges for various pieces of construction equipment at a distance of 50 feet are depicted in *Figure 5*. Note that these are maximum noise levels, not the average sound level generally used in this assessment. The average sound level at construction sites is typically less than the maximum noise level because the equipment operates in alternating cycles of full power and low power. Also, the equipment rotates in various directions (i.e., noisiest side of the equipment to quieter sides of the

equipment), and moves around the construction site, especially during clearing, grubbing and grading activities. Thus, the average noise levels produced are less than the maximum level.

Typically, the greatest one-hour average noise level occurs during clearing, grubbing and grading activities. Construction equipment used during this construction phase typically include scrapers, dozers, compactors and water trucks. We have conducted noise measurements utilizing similar graders, bulldozers, loaders, water trucks, etc. Based on those noise measurements, the one-hour average noise level during ground clearing and grading activities ranges from approximately 75 to 80 dB at 50 feet from the closest construction work area. Equipment operated during the noise measurements typically included 6 or more scrapers and dozers, and 2 or 3 water trucks, backhoes, loaders, blades and pickup trucks.

5.6.1 Construction Noise Impact Associated with On-site Development

Construction noise in a well-defined area typically attenuates at approximately six dB per doubling of distance (Beranek and Ver 1992). The closest off-site homes to the construction activities would be located along the west end of Mount Whitney Road approximately 70 feet from the development area of the site. The one-hour average noise level would be approximately 77 dB or less at the closest homes during grading of the site. This assumes a direct line-of-sight from the receiver to the construction area. This noise level would exceed the County's noise criteria at the homes. Construction noise would be less at other areas and during the later phases, such as foundation construction and framing.

Blasting would be required at as many as approximately 18 areas at the site, as shown in *Attachment 4*. Blasting would occur between 7:00 a.m. and 5:00 p.m. Three additional off-site areas may also require blasting and are discussed in Sections 5.6.3 and 7.2. Construction blasting generates a maximum noise level of approximately 94 dB at a distance of 50 feet (BBN 1989). The blast is generally perceived as a dull thud, rather than as a loud explosion. Blasting operations would be in general conformance with the blasting specifications prepared by the U. S. Bureau of Mines and the blasting permit requirements issued by the County of San Diego (Title 3, Division 5 of the San Diego County Code of Regulatory Ordinances Relating to Blasting Operations, as amended, Ordinance 7821, September 1990). The blasting contractor would be required to limit the blasting intensities so as to prevent damage to all existing structures, and in no case would intensities exceed the safety standard of particle velocity recommended by the U.S. Bureau of Mines.

Drilling would be necessary to bore holes for the blasting materials. Rock drills generate noise levels of approximately 80 to 98 dB at a distance of 50 feet. Typically, drilling holes for a blasting pattern can last from several hours to several days. The period of time to drill per blast depends of several factors including the number of holes, the depth of the holes and the effort required to drill through the rock. No more than one to two blasts would occur in any one area per day because of the time required to drill the holes as well as insert and connect the blasting materials. The closest homes would be located adjacent to the northern and southern portions of the site approximately 175 feet away from potential blasting areas (*Figures 6A and 6C*). Assuming drilling and blasting activities are conducted adjacent to the closest homes, that the loudest drill operates continuously for an hour, and two blasts are conducted, the one-hour average noise level would be approximately 87 dB at the closest homes. This noise level would

exceed the County's noise ordinance criteria by 12 dB. The primary noise source would be the drilling and not the blast due to short duration of the blast compared to the ongoing drilling activity. Discussions with the applicant indicate that the drilling and blasting would occur in one area and move on to the next area (New Urban West, May 24, 2005). There would not be simultaneous areas of drilling and blasting. The location of the closest existing homes to the blasting areas are included in *Attachment 4*.

The project would be developed in three phases. Based on a preliminary site development schedule, the drilling and blasting activities would occur during the rough grading activities at the site (J.T. Kruer, June 16, 2004). Grading and blasting activities would begin at the southern portion of the project and continue in a northern direction. Grading and blasting in Phase 2 would be completed prior to occupancy of units in Phase 1. Grading and blasting in Phase 3 will be completed prior to occupancy of Units in Phase 2. Thus, there would be distance buffer of approximately 1,000 or more feet between occupied units and construction activities, and construction noise would be less than a one-hour average noise level of 75 dB. In addition, the applicant anticipates that there would not be any rock crushing on-site.

The WRF facility would be located within an inactive rock quarry site. There are no existing homes in close proximity to the WFR site. The construction activities would generate less than significant noise impacts.

As previously stated, the hours of construction would comply with the County's allowable hours of construction (i.e., 7:00 a.m. to 7:00 p.m. Monday through Saturday, excluding legal holidays).

The grading associated with Village project features is anticipated to be balanced on site.

5.6.2 Construction Noise Associated with Off-Site Sewer Pipeline

As previously described, wastewater treatment Option 2 would require installing an off-site pipeline. The pipeline construction would most likely be completed using open trench methods within roadway rights-of-way. Construction phases associated with the open-cut pipeline installing would include trenching, pipe laying, backfill/compacting and pavement reinstatement. The primary noise sources would most likely include excavators, backhoes, loaders, dump trucks, cranes, welders, crew and delivery trucks, water trucks, and roller compactors. The duration of the overall construction activity would be approximately 12 months for either Option 2a or 2b.

Option 2

Sewer pipeline construction for Option 2a would occur within the existing roadbed of Harmony Grove Road. There are approximately 20 to 25 existing homes that are within approximately 50 to 100 feet of Harmony Grove Road along the pipeline alignment. At this distance, the maximum noise levels would range up to approximately 80 to 85 dBA. The one-hour average sound level would be expected to be substantially less than the maximum sound level because of the intermittent nature of construction work. Based on noise measurements of trenching, pipe laying, paving and compacting activities made by Pacific Noise Control previously, the average noise level would range up to approximately 70 to 75 dB at a distance of 50 feet. The duration to

complete any phase of the open trench phases of the project such as trenching, backfilling, etc., will vary, but would typically proceed at a rate of approximately 100 feet per day. Thus, the forward progression of construction activities would mean that the noise impact may last for only two to three days at any one location. The construction activities would comply with the County's and City's allowable hours and would result in a less than significant noise impact due to the short-term duration of the impact.

Construction for Option 2b would occur concurrently with the potential new Village Road portion of the project discussed in Section 4.6.3. Option B between Harmony Grove Road and Citracado Parkway. The closest existing homes would be located approximately 200 or more feet from the roadway construction area. At this distance the average noise level associated with the construction activities would be less than 65 dB and the noise impact would be less than significant. The remaining portion would occur adjacent to approximately 15 to 20 existing homes located along Avenida del Diablo and Hale Avenue. The homes are located approximately 25 to 50 feet from the roads. The location of the pipeline within the road is currently unknown. Assuming it as at the edge, of the road the one-hour average noise level would range between approximately 75 and 81 dB. The pipeline construction could exceed the City's noise ordinance criteria depending on the location of the pipeline construction activities within the roadbed. This noise impact would result in a significant short-term noise impact.

5.6.3 Construction Noise Associated with Off-Site Road Improvements

As previously described, offsite road improvements would be required for Options A, B and C. The construction techniques would be similar for any of the options. The primary noise sources would most likely include a scraper, graders, loaders, paver, heavy trucks, crew and delivery trucks, water trucks, and roller compactors.

Common to all three options, the grading associated with roadway improvements/sewer lines, etc., would be expected to require import of approximately 50,000 cubic yards of fill to the improvements at Via Rancho Parkway/Valley Parkway. Grading activities for this phase are expected to occur over the course of a calendar year. The fill import site is not currently known, but may be from potential off-site road improvements along Country Club Drive or Harmony Grove Road. Also, import may come from nearby projects or projects farther away via Highway 78 and I-15. Using a 5-day work week, and assuming haul trucks with a 10 cubic yard capacity, this would equate to approximately 19 loaded truck trips per day, or average of 2.4 loaded trucks per hour over this period. Of course, it is more likely that focused work would result in an emphasis on completion of fill requirements in any one location within a more restricted time period. This would result in an emphasis on completion of fill requirements in any one location within a more restricted time period. This would result in heavier truck loading on the local roadway for a more intensive, but correspondingly briefer, period of time. The noise impact associated with heavy trucks along the adjacent roads would be less than significant. Additional information regarding construction noise at off-site road improvement areas is discussed below.

<u>Option A</u>

This option would widen Harmony Grove Road from the future intersection with Village Road to Kauana Loa Drive and a connection to a short segment of future Citracado Parkway. Also,

Construction activities would occur at the intersection of Valley Parkway and Via Rancho Parkway, at the intersection of Andreasen and Auto Parkway. The duration of the overall construction activity would be approximately 12 months.

Approximately five homes are adjacent to this segment of Harmony Grove Road. The construction activities would generally be 100 or more feet from the closest homes. However, near the intersection of Harmony Grove Road and Kauana Loa Drive the road would be realigned within approximately 40 feet of an existing residence. At this distance, the combination of larger equipment such as a scraper and grader with a water truck would generate a one-hour average noise level that would exceed 75 dB. The construction noise would result in a significant noise impact.

The closest home to the construction activities at the intersection of Valley Parkway and Via Rancho Parkway would be located approximately 150 feet from the construction area. At this distance the noise impact would be less than significant.

Andreasen Drive is within a commercial area and there are no noise sensitive uses adjacent to the proposed road improvement areas. Therefore, the noise impact within this area would be less than significant.

Blasting/drilling may be necessary along Harmony Grove Road between the project site and south of Kauana Lua. There are existing homes in close proximity to the blasting area. However, these homes would be purchased as part of the project. Thus, the closest remaining existing homes would be approximately 300 or more feet from the blasting area. At this distance the one-hour average noise level would be 82 dB. This noise level would exceed the County's noise ordinance criteria by seven dB.

Option B

This option would construct new Village Road east of Harmony Grove Road to connect with the future alignment of Citracado Parkway. The duration of the overall construction activity would be approximately 12 months. The closest existing homes would be located approximately 50 feet from the roadway construction area (*Figure 6B*). At this distance, the combination of larger equipment such as a scraper and grader with a water truck would generate a one-hour average noise level that would exceed 75 dB. The construction noise would result in a significant noise impact.

The closest home to the construction activities at the intersection of Valley Parkway and Via Rancho Parkway would be located approximately 150 feet from the construction area. At this distance the noise impact would be less than significant.

Blasting/drilling may be necessary along several sections of Village Road between Harmony Grove Road and Citracado Parkway. The closest homes would be located approximately 50 feet from the proposed blasting area. At this distance, assuming that the loudest drill operates continuously for an hour, and two blasts are conducted, the one-hour average noise level would be approximately 98 dB at the closest home. This noise level would exceed the noise ordinance criteria by 23 dB.

Option C

Construction activities would be similar to those described for Option A. However, the duration of the overall construction activity would be approximately 15 months. In addition, there are existing homes along Harmony Grove Road between approximately Howard Street and Hale Avenue within the City of Escondido. The City's construction noise criterion is that the one-hour average noise level should not exceed an average sound level of 75 dB. Because of the close proximity to the homes to the construction area, i.e., immediately adjacent to residential properties, the noise level would exceed an hourly average of 75 dB when equipment is operating adjacent to the residences. The construction noise would result in a short-term significant noise impact where equipment is operating immediately adjacent to residences. The significant noise impact would primarily occur where grading and preparation for a new road bed is immediately adjacent to noise sensitive uses.

The closest home to the construction activities at the intersection of Valley Parkway and Via Rancho Parkway would be located approximately 150 feet from the construction area. At this distance the noise impact would be less than significant.

6.0 MITIGATION

6.1 On-site Traffic Noise

Exterior Noise

The noise impact at the homes could feasibly be mitigated by constructing minimum six-foot high noise barriers at the affected residences along Harmony Grove Road, Country Club Drive and Village Road. The noise barriers would be required for Lots 224-227 adjacent to Harmony Grove Road, Lots 236, 237, 243-248, 425-427, 554, 569, 575, 581, 587, 593, 599, 600, 605, 606, 610 and 633 adjacent to Country Club Drive and Lots 616, 623, 638, 643 and 647-650 adjacent to Village Road. The preliminary noise barrier locations and heights required to mitigate the future CNEL to 60 dB or less are depicted in *Figures 7A and 7B*. The noise barrier heights are relative to the pad elevations except where the noise barrier would be located along Country Club Drive. Along Country Club Drive the height of the wall is relative to the top of slope adjacent to the road. The noise barrier height and top of elevation are summarized in *Table 5*.

If the alternative residences are developed at the proposed WRF site, Lots 660-664 will also require noise mitigation for on-site traffic noise impacts as shown in *Figure 7C*.

The noise barriers may consist of an earthen berm, sound wall or combination of both. The materials used in the construction of the sound wall are required to have a minimum surface density of 3.5 pounds per square foot. They may consist of masonry material, Plexiglas, tempered glass or a combination of these materials. The barrier must be designed so there are no openings or cracks.

Table 5 Summary of Noise Barrier Heights and Locations

Lot	Pad Elevation (ft. amsl)	Barrier Height (ft.)	Top of Barrier Elevation (ft. amsl)	Barrier Location
224	592.0	6	598.0	Pad
225	594.0	6	600.0	Pad
226	596.0	6	602.0	Pad
227	596.0	6	602.0	Pad
236	592.0	6	Varies	Pad and R/W
237	537.0	6	Varies	R/W
243	628.0	6	Varies	R/W
244	630.0	6	Varies	R/W
245	630.0	6	Varies	R/W
246	630.0	6	Varies	R/W
247	632.0	6	Varies	R/W
248	634.0	6	Varies	R/W
425	653.7	6	659.7	Pad
426	653.0	6	659.0	Pad
427	653.3	6	659.0	Pad
554	603.5	6	Varies	R/W
555	602.0	6	Varies	R/W
556	600.5	6	Varies	R/W
557	599.0	6	Varies	R/W
558	597.5	6	Varies	R/W
559	596.0	6	Varies	R/W
560	594.5	6	Varies	R/W
569	654.5	6	660.5	Pad
575	655.5	6	661.5	Pad
581	656.7	6	662.5	Pad
587	657.7	6	663.7	Pad
593	658.9	6	664.9	Pad
599	659.9	6	665.9	Pad
600	660.2	6	666.2	Pad
605	664.5	6	670.5	Pad
606	664.8	6	670.8	Pad
610	665.2	6	671.2	Pad
616	669.1	6	675.1	Pad
623	670.1	6	676.1	Pad
633	620.0	6	varies	R/W
638	672.7	6	678.7	Pad
643	674.0	6	680.0	Pad
647	674.2	6	680.2	Pad
648	673.6	6	679.6	Pad
649	672.9	6	678.9	Pad
650	671.8	6	677.8	Pad

The mitigation measures are based on the vesting tentative map. A subsequent noise study will be required to determine whether the proposed barrier will mitigate the exterior noise level if changes are made to the proposed building pad elevations or locations as shown in the tentative map.

Interior Noise

An interior noise study would be required prior to issuance of building permits for Lots 224-227, 236, 237, 242-248, 425-427, 554-562, 564, 569, 570, 575, 576, 581, 587, 593, 599, 600, 605, 606, 610, 611, 616, 623, 624, 630-633, 638, 639, 643, 647-650 and 660-664 to ensure that the interior noise levels would not exceed a CNEL of 45 dB. Even with implementation of the noise barriers identified above, the interior noise level could be exceeded at the second floor level. The preliminary unmitigated exterior noise levels at the second floor levels of representative lots are included as part of *Attachment 2*. To mitigate the noise impact the homes on these lots would most likely require air-conditioning or mechanical ventilation so that the windows could be closed at the occupant's discretion. Sound-rated windows may also be required.

6.2 Off-Site Traffic Noise

Option A

There is one home along Harmony Grove Road between Village Drive and Kauana Loa Drive that may be subject to a significant noise impact. Based on a preliminary noise analysis for the off-site residence, an eight-foot high noise barrier would mitigate the noise level to approximately 61 dB CNEL. The location of the noise barrier is depicted in *Figure 8*. The traffic noise impact is considered significant and unmitigated because the noise level would not be mitigated to 60 dB CNEL and there is no guarantee at this time that private property owner would agree to implementation of a sound wall on private property. Also, the County Department of Public Works may not allow the construction of a noise barrier within the Right-of-Way. It should be noted that a noise protection easement is not feasible because the applicant does not own the properties. A noise barrier at the front of the home would not be feasible to mitigate the noise impact to the front facade of the house because the driveway opening would limit the effectiveness of the noise barrier. Thus, the project would contribute to a significant and unmitigable cumulative traffic noise impact.

Option B

Preliminarily there are approximately 40 existing homes and a mobile home park along Avenida del Diablo between Valley Parkway and Citracado Parkway that would be exposed to a significant noise increase. The traffic engineer has evaluated several options to reduce traffic volumes along Avenida del Diablo between Citracado Parkway to Valley Parkway (LLG 2006b). One of the options (identified as Option 3: Raised Median on Citracado Parkway at Avenida Del Diablo) would reduce the ADT traffic volumes so that the noise level increase would be less than five dB along this segment of Avenida del Diablo (see *Attachment 5* for traffic and noise level increase information). This would mitigate the traffic noise impact along Avenida del Diablo. However, it would redistribute additional traffic along Citracado Parkway between Avenida del Diablo and Valley Parkway, resulting in a direct project noise level increase of six dB. This

increase would result in significant noise impact at residences along this section of Citracado Parkway. However, it should be noted that Citracado Parkway is a County and City four-lane Circulation Element Road with a design capacity substantially greater than the near-term project traffic volumes.

Traffic Option 1 (Cul-de-sac between Citracado Parkway and Hale Avenue) would mitigate the noise impact along Avenida del Diablo between Citracado Parkway to Hale Avenue. However, this option would result in a significant noise impact at along Avenida del Diablo between Hale Avenue and Citracado Parkway. Also, a significant noise impact would result along Citracado Parkway between Avenida del Diablo to Valley Parkway.

Traffic Option 2 (Cul-de-sac just East of Hale Avenue) would mitigate the traffic noise impact along Avenida del Diablo between Hale Avenue and Valley Parkway. However, this option would result in a significant noise impact at along Avenida del Diablo between Citracado Parkway and Hale Avenue. Also, a significant noise impact would result along Citracado Parkway between Avenida del Diablo to Valley Parkway.

To mitigate the resulting direct noise impact, associated with implementation of these traffic options, to below the five dB criterion used by the City of Escondido would require six-foot high noise barriers along the backyards (at the top of slope if the yard slopes significantly above the road elevation) of residences along the significant noise impact sections of Avenida del Diablo and Citracado Parkway. The road segment(s) requiring noise barrier mitigation will depend on which of the three options is selected. However, the feasibility of implementing these measures is dependent on obtaining permission from private property owners or the City approval of encroachment permits for the Right-of-Way. Without these barriers, the project related traffic noise impacts are significant and unmitigated.

Option C

In addition, to the home identified in Option A, there are approximately 20 homes along Harmony Grove Road between Enterprise Street and Hale Avenue in the City of Escondido. The majority of these homes have front yards facing Harmony Grove Road. Noise barriers would not be feasible for these homes because the driveway openings would limit the effectiveness of the noise barriers. There are approximately four homes with backyards facing Harmony Grove Road where noise barriers may be feasible. A site-specific noise mitigation study should be conducted evaluating noise barriers for the homes with backyards abutting Harmony Grove Road. The noise barriers should mitigate the traffic noise by at least five dB at these backyards.

The location of the noise barriers for Options A, B and C may be on private or public right-of-way. The applicant should implement feasible noise abatement if permitted by the home owner(s). Noise barriers along public right-of-way(s) would require approval from the County or City. If permission is not given and a noise wall cannot be constructed, or if a noise wall is not feasible, the noise impact would be considered significant and unmitigated.

6.3 Wastewater Reclamation Facility Noise

To mitigate the equipment noise would depend in part on the orientation of the facility components and most likely require implementation of noise control measures similar to those at the Santa Fe Valley WTP. These noise abatement measures include sound attenuators, acoustical louvers, sound-rated doors, sound absorbing materials on the walls and ceilings of the buildings enclosures, silencers and other building materials and features. These various features are summarized in *Table A3.1 in Attachment 3.* The proposed WRF would have a design capacity for an average annual daily flow of 230,000 gallons per day

In addition, the following measures should be incorporated into the project design.

1. Orient the generator room so that the side of the building with the engine exhaust louver faces to the east.

2. Install a minimum 3-foot long sound attenuator at the generator room exhaust louver.

3. Install a minimum 3-foot long sound attenuator at the generator room intake louver

4. Orient the air compressor room so that the intake louver faces to the east.

5. Orient the blower room so that the intake louver faces to the east.

With the noise abatement control measures it is anticipated that the noise level would be mitigated to 45 dB or less at the property boundaries.

These measures are preliminary and subject to change during the MUP facility design phase to ensure appropriate noise abatement measures are implemented.

A noise study will be prepared prior to the MUP final facility design approval to ensure that necessary noise abatement measures incorporated into the building and site plans to mitigate the equipment noise from the WTP to 45 dB or less at the property lines. Also, sound testing will be required during the installation of various facility components and a final test when all equipment is installed.

The report shall include the following measurements to provide evidence of compliance:

a) A minimum 24-hour measurement of the site's existing noise conditions including any interim plant operations on a non-holiday weekend. Provide a log of hourly Leq and L90 measurements noting weather conditions and any temporary noise events. The measurement shall be five feet above the ground and shall be located outdoors within 75 feet, but no closer than 30 feet from any sound attenuation louver located on the facility buildings.

b) Provide a set of noise measurements of the permanent facility operations demonstrating property line compliance and for a comparison with estimated values provided in the Noise Control Plans submitted prior to the issuance of building permits. The certification is required to

include an ambient and separate equipment noise measurements at the four critical property line locations of maximum noise generation as shown in Figure 1.1-12 in *Attachment 3*. The standby emergency generator shall be operated in addition to all of the other plant equipment.

c) At least 48 hours prior to starting the on-site noise evaluation of the wastewater reclamation facility, the applicant shall notify nearby residents and businesses (within a quarter mile radius) of the project's operational test.

6.4 Pump Station Noise

Option 1

Preliminary noise mitigation measures identified for the pump station include:

1. Three-foot long sound attenuators at the generator engine exhaust and intake air louvers (IAC Model 3 LFS, or equivalent).
2. 3-foot long sound attenuator at the exhaust fan opening (IAC Model 3ES, or equivalent).
3. 12" thick acoustical louvers at the generator engine exhaust and intake openings (Construction Specialties Model A-12350, or equivalent).
4. Replace roll-up door with sound rated doors having a minimum STC 50 rating.
5. Install a super critical grade silencer for the engine generator (GT Exhaust Model 201-6100, or equivalent).
6. The exhaust pipe between the muffler and exterior outlet should have at least one 90 degree turn.
7. Install 2-inch thick sound absorbing material on at least 50% of the interior and ceiling surfaces of the building.
8. Orient the door side of the building to the closest residences and the engine exhaust louver side toward the park's parking lot.
9. Permit the testing of the generator once a week between the hours of 9 a.m. and 5 p.m. excluding Sundays and holidays as defined by Section 36.410 of the County Noise Ordinance.
10. Implementation of these measures would result in a one-hour average noise level of 45 dB or less at any adjacent residential property line, and during testing would be a one-hour average of 50 dB at the day use area portion of the park. A noise study will be prepared prior to final facility design approval to ensure that necessary noise abatement measures incorporated into the building and site plans to mitigate the equipment noise from the pump station to the noise levels described above.

11. Prior to final occupancy or certification for the permanent facilities of the pump station the applicant shall submit to the satisfaction of the Director of the DPLU a noise certification report prepared by a County-certified acoustical consultant that evaluates and implements any necessary measures to demonstrate compliance to the property line sound level limits identified in item 10 above. The report shall include the following measurements to provide evidence of compliance:

    a) A minimum 24-hour measurement of the site's existing noise conditions including any interim plant operations on a non-holiday weekend. Provide a log

of hourly Leq and L90 measurements noting weather conditions and any temporary noise events. The measurement shall be five feet above the ground and shall be located outdoors within 75 feet, but no closer than 30 feet from any sound attenuation louver located on the facility buildings.

b) Provide a set of noise measurements of the permanent facility operations demonstrating property line compliance and for a comparison with estimated values provided in the Noise Control Plans submitted prior to the issuance of building permits. The certification is required to include an ambient and separate equipment noise measurements at each property line. A sound test shall be conducted to determine the location of the hourly 50 dB noise contour when the standby emergency generator is in operation.

c) At least 48 hours prior to starting the on-site noise evaluation of the pump station, the applicant shall notify nearby residents and businesses (within a quarter mile radius) of the project's operational test.

Option 2

The noise mitigation would be the same as described for Option 1.

6.5 Equestrian Center Noise

The PA system noise can be mitigated by locating the speakers as shown in *Figure 9*. The speakers at the show arenas should be not higher than 15 feet above the ground and the front axis of the speakers oriented at an angle of 20 degrees or more from the horizontal plane down to the ground. The speakers at the barn can be placed inside the barn or outside on the building. If the speakers are outside, they should be oriented facing the ground. The PA system is to be used only between the hours of 7:00 a.m. to 7:00 p.m. and shall generate an hourly average noise level of 50 dB or less at the adjacent property boundaries. A maximum of five speakers could be used at the site. There would be one speaker for each of the two show arenas and three speakers at the main barn. The speakers would be either Radio Shack Model 40-1439 or 40-1440. These speakers have a maximum sound rating of 104 dB and 102 dB at three feet, respectively. Equivalent substitute speakers could also be used that have the same or lower sound ratings and shall be horn style speakers that are open at the front half and closed at the back half. Other designs may also be feasible. Prior to the first show, a noise abatement study, provided by a County certified acoustical consultant, should be provided to the County DPLU that demonstrates that the PA system has been tested and complies with the County's noise ordinance criteria.

6.6 Fire Station, Church, Tack and Feed Store or School Noise

A noise study would be required prior to issuance of use permits for Lots 656 and 657. The noise study would identify specific noise abatement measures to mitigate the noise impact to comply with the County's noise ordinance criteria. These measures may include noise barriers, equipment/building setbacks, silencers, sound attenuators, acoustical louvers, quieter equipment, sound absorbing materials and other noise control design features.

6.7 Construction Noise Mitigation

Construction Mitigation Associated with On-site Development

The construction noise impact at the existing residences adjacent to the northern property boundary (i.e., along Lots 7, 8, 45, 46 and 69-73) could be mitigated by using quieter equipment when immediately adjacent to existing homes. Smaller dozers, loaders, compactors, and backhoes can generate sound levels 80 dB or less at 50 feet from the equipment.

It should be noted that a noise barrier such as a temporary plywood wall, may not be feasible because the construction equipment would be working a slope. Thus, the equipment would at times be higher than a wall resulting in a direct line-of-sight from the construction equipment to adjacent homes.

The proposed project could result in a significant short-term noise impact when drilling holes for blasting are within 700 feet from the existing residences. To mitigate the noise impact would require using a relatively quieter rock drill to achieve the County's noise criteria. A rock drill with a noise level of 89 dB or less at 50 feet would mitigate the noise impact. Also, a temporary noise barrier located around the rock drill could also be used. The height of the noise barrier would depend on several factors including the rock drill noise level, distance from the drill rig to the receiver, and the elevation of the drill rig relative to the receiver. Depending on various geometric and design factors, a temporary noise barrier could attenuate the drilling noise by approximately 5 to 15 dB. Assuming a temporary noise barrier is constructed approximately 20 feet from the drill rig, that the closest receptor is 50 feet from the drill rig, and both the drill rig and receiver are at the same elevation, then a 14-foot high noise barrier would mitigate the one-hour average noise level to 75 dB. The temporary barrier could be constructed of minimum 3/4-inch thick plywood with R-11 fiberglass insulation batts attached to the interior of the panels. Alternatively, temporary portable barriers, made from a variety of materials, are available from various noise control manufacturers.

Any rock drill used at the site shall be tested by a County-certified acoustical consultant prior to use on the project site. The results of the sound tests shall be filed with the County DPLU. The report shall summarize the results of the sound test and method of compliance with the County's noise ordinance criteria (i.e., demonstrate that the rock drilling would be located far enough from the property lines or that a temporary noise barrier around the drill would mitigate the one-hour average noise level to 75 dB or less at the adjacent property lines).

Additional noise abatement measures shall include:

Noise monitoring shall be conducted as part of a Noise Control Plan during the initial construction operation to ensure that the noise level complies with the County's noise ordinance limits. Potential construction noise monitoring locations have been identified and are located near adjacent homes as depicted in *Figure 10*. If the noise monitoring indicates that the County's noise criteria may be exceeded, subsequent monitoring will be conducted after implementation of remedial noise abatement measures. A noise report shall be filed with the County DPLU summarizing the results of the noise monitoring and method of compliance. If noise complaints

are received from off-site residences, the County Department of Noise Abatement shall respond to the complaints by providing the results of the noise measurements to the complainant, if the location of the noise measurements are applicable to their property. If applicable noise measurements are not available for the complainant property, the developer will conduct a sound test at the complainant's property. The results of the noise measurement will be submitted to the County within three business days of the noise monitoring. If the noise measurement indicates that the project is in compliance with the County's noise ordinance criteria, no additional sound tests will be required at the complainant's property (or similar adjacent properties) if additional complaints are received. If the noise level exceeds the allowable limit then remedial noise abatement measures shall be implemented and subsequent noise measurements conducted to verify compliance with the County's construction noise level requirement.

Rough grading would occur at the beginning of each of the three phases of development lasting for a period of approximately three to five-months per phase. During these rough grading phases drilling and blasting activities would also occur. A disclosure statement shall be provided to home buyers within the project site stating that they will be exposed to noise from construction activities during the remaining phases of development.

Site deliveries and construction equipment shall only occur during the time period allowed by the County's noise ordinance (i.e., 7:00 a.m. through 7:00 p.m., Monday through Saturday). Also, access to the site shall be secured and gates locked so that no vehicles or equipment shall enter the site prior to 7:00 a.m. Also, there shall be no queuing of trucks inside or outside the site, warming-up/idling of engines or equipment prior to 7:00 a.m.

Also, residents within 200 feet of the construction activities should be notified of the construction schedule at least one week prior to initial activities. The notification shall include the construction hours and days of operation, anticipated construction duration, as well as the construction superintendent's name and work phone number.

Construction Noise Associated with Off-Site Sewer Pipeline

The short-term noise impact at the homes along Avenida del Diablo could be mitigated by constructing a temporary minimum eight-foot high noise barrier along the right-of-way of the homes adjacent to Avenida del Diablo. The temporary barrier could be constructed of minimum 3/4-inch thick plywood. Alternatively, temporary portable barriers, made from a variety of materials, are available from various noise control manufacturers. Manufacturer barriers should have a minimum STC 20 rating. Noise barriers would not be feasible at the homes along Hale Avenue because the driveway openings to the homes would limit the effectiveness of noise barriers. The noise level would exceed the City's construction noise level criterion when equipment is operating adjacent to the residences (approximately one to two days at each residence), thus resulting in a significant short-term unmitigated noise impact.

Construction Noise Associated with Off-Site Road Improvements

Option A

Near the intersection of Harmony Grove Road and Kauana Loa Drive the road would be realigned within approximately 40 feet of an existing residence. At this location, the construction noise could be mitigated with a 12-foot high noise barrier adjacent to the residence. The location of the noise barrier is depicted in *Figure 11*. As shown, the noise barrier would be approximately 200 feet long and would not limit access to this residence. The noise barrier should be left in place until the completion of construction, or until it can be demonstrated that the construction noise is in compliance with the County Noise Ordinance. The temporary barrier could be constructed of the same materials described above for the off-site sewer pipeline.

Noise mitigation associated with drilling and blasting activities would be the same as identified above (Construction Mitigation Associated with On-site Development).

Option B

Near the intersection of Avenida del Diablo and Citracado Parkway the road would be constructed within approximately 50 feet of existing residences. The construction noise could be mitigated with a 12-foot high noise barrier adjacent to the construction area. The location of the noise barrier is depicted in *Figure 12*. As shown, the noise barrier would be approximately 120 feet long. The noise barrier should be left in place until the completion of construction, or until it can be demonstrated that the construction noise is in compliance with the City's Noise Ordinance. The temporary barrier could be constructed of the same materials described above for the off-site sewer pipeline.

Noise mitigation associated with drilling and blasting activities would be the same as identified above (Construction Mitigation Associated with On-site Development).

Option C

Mitigation would be the same as Option A.

Noise barriers would not be feasible at the homes along Harmony Grove Road between approximately Howard Street and Hale Avenue because; 1) the driveway openings to the homes would limit the effectiveness of noise barriers; and 2) the close proximity of the homes to the construction area, i.e., immediately adjacent to residential properties limits the achievable noise level at the properties. The noise level would exceed the City's construction noise level criterion when equipment is operating adjacent to the residences, thus resulting in a significant short-term unmitigated noise impact.

7.0 COUNTY REQUESTED ROADWAY CLASSIFICATIONS REVIEW

County staff have requested review of roadway classifications related to curve radii. Particularly with regard to: (1) Country Club Drive, (2) on-site Village Road, and (3) the project-abutting portion of Harmony Grove Road east of Country Club Drive. This has been requested in order to support final design decisions regarding whether the on-site and abutting portions of these roads would proceed as currently contemplated by the proposed project, or would be modified to reflect one or more of the design scenarios. The review of roadway classifications incorporates road design speeds ranging up to 45 mph on-site, and 40 mph off-site, as well as the alignment options necessary to accommodate the curve radii at these speeds.

7.1 Traffic Noise Impacts

Circulation changes proposed to comprise part of the Harmony Grove Village Project would occur both on and off site. In addition, in three areas, although a particular road classification has already been identified, the specific design speed and associated physical configuration will be decided upon by the Board of Supervisors as part of the project approval process. In these instances, information is provided throughout this report with regard to three design scenarios related to 30, 35 and 40 mph design speeds—with associated appropriate curve radii and super elevation requirements on these rural roads. The noise impacts associated with specific on-site and off-site/abutting roadway proposed classifications are described below.

On-Site Traffic Noise Impacts

Revised residential lot design plans have not been prepared for these various roadway classification scenarios. However, based on an increase in speed of up to 45 mph on Country Club Drive and Village Road, and 30 mph along Harmony Grove Road east of Country Club Drive, and using the lot and road alignment information in the proposed TM, the traffic noise level would increase by one to three dB at the lots adjacent to Country Club Drive and Village Road. The same lots that would exceed 60 dB CNEL with the proposed project would also exceed 60 dB CNEL with the increased traffic speeds. In addition, the noise level would exceed 60 dB CNEL at multi-family Lots 630-632. Therefore, similar to the proposed project, noise mitigation would be required.

Off-Site Traffic Noise Impacts

Three road design alternatives include realigning Country Club Drive to the west of an existing hill at the northern portion of the site and through a hill located east of Mt. Whitney Road. These alternatives would provide road design speeds ranging from 30 to 40 mph around the curves. The 30 and 35 mph alternatives, with the existing plus project traffic volumes, would result in a significant noise impact at one home located where the road would be realigned in close proximity to the house (Receptor 4 on *Figure 13*). The 40 mph alternative alignment would result in the taking of one home (Receptor 4) that would be within the proposed alignment. The existing plus project noise levels at receptors adjacent to County Club Drive are depicted in *Table 6*.

The near-term cumulative project traffic volume, would result in significant noise impacts at sites previously identified above. Also, with the 35 mph alternative, the home at Receptor 9 would subject to a significant near-term cumulative noise impact at the front of the home. With the 40 mph alternative the front of the homes at Receptors 8 and 9 would be subject to significant noise impacts. The project's portion of the cumulative noise impact is cumulatively considerable. The noise level at the backyards of the homes would be less than 60 dB CNEL and the noise impact would be less than significant at the backyards of the homes at Receptors 8 and 9. The existing plus project plus cumulative noise levels at receptors adjacent to County Club Drive are depicted in *Table 7*.

Several design alternatives are proposed for Harmony Grove Road between Country Club Drive and proposed Village Road. The road improvements proposed along this segment of road would not located adjacent to noise sensitive receivers. Therefore, the noise impacts associated with these various alternatives are less than significant.

Table 6

Off-Site Country Club Drive CNEL Noise Level
(Existing Plus Project)

Receptor	Existing	Design Alternative		
		30 mph	35 mph	40 mph
1	51	55	55	55
2	54	52	52	52
3	55	52	52	52
4	52	**65**	**65**	NA
5	53	57	57	58
6	51	54	54	55
7	51	55	55	56
8	55	60	60	60
9	55	60	60	60

Notes:

Bold = exceeds County's significance criteria
Receptor sites are at the closest location of the house or backyard to Country Club Drive

Table 7

Off-Site Country Club Drive CNEL Noise Level (Near-Term Cumulative)

Receptor	Existing	Design Alternative		
		30 mph	35 mph	40 mph
1	51	56	56	56
2	54	52	53	53
3	55	53	53	53
4	52	**66**	**66**	NA
5	53	58	58	59
6	51	55	55	56
7	51	56	56	57
8	55	60	60	**61**
9	55	60	**61**	**61**

Notes:

Bold = exceeds County's significance criteria
Receptor sites are at the closest location of the house or backyard to Country Club Drive

7.2 Construction Noise Impacts

The various design alternatives would require off-site construction activities at three general areas where there are relatively sharp curves. Two of these areas are adjacent to Country Club Drive. One area is at the curve located at the northern portion of the site. The second area is located at a curve north of the site just south of Mt. Whitney Road. The third area is located along a portion of Harmony Grove Road between Country Club Drive and proposed Village Road.

At the northern portion of the site there would generally be two to three homes adjacent to the construction activities. The construction activities would be approximately 35 to 90 feet away from the closest residences depending on the design alternatives. The construction activities would include grading and associated road paving activities. With the 35 and 40 mph design alternatives the construction noise levels could exceed the County's hourly average 75 dB construction noise criterion.

At the construction area north of the site the closest residences would be located approximately 150 feet or more from the construction area. Construction activities in this area would include, grading, blasting, drilling and paving. At this distance the average noise level with construction activities could exceed 75 dB due to the drilling operations. Thus, the noise impact would be significant.

The construction activities along Harmony Grove Road would not be located in close proximity to existing residences. Therefore, the noise impacts along Harmony Grove Road would be less than significant.

7.3 Mitigation Associated with County Requested Roadway Classifications

On-Site Traffic Noise

Revised residential lot design plans have not been prepared for these various roadway classification scenarios. However, based on the existing TM lot design and assuming the maximum speeds associated with the various alternative road classifications, six-foot high noise barriers would mitigate the noise impact, including the adjacent multi-family lots. The exact location and heights of the noise barriers would be determined when site specific plans are prepared based on the selected road design alternative and anticipated revised TM lot design.

Off-Site Traffic Noise

Preliminarily, to mitigate the resulting direct and cumulative noise impact at Receptor 4, associated with implementation of these traffic options, would require six-foot high noise barriers along a portion of the realigned section of Country Club Drive as shown in *Figure 14* (30 mph) and *Figure 15* (35 mph). The noise barriers would reduce the future noise level to less than 60 dB CNEL at the significantly impacted home. Implementation of the noise barriers reduces the noise impact to less than significant.

The noise impact at Receptors 8 and 9 could not be mitigated due to the driveway openings facing Country Club Drive. Also at Receptor 9, the front yard slopes down to Country Club Drive and a sound wall would not be feasible except in very close proximity to the front of the house.

Construction Noise

Noise mitigation would be similar to the proposed project identified in Section 6.7 (Construction Mitigation Associated with On-Site Development). The location of the noise barriers can be determined if/when a specific alternative is adopted.

8.0 REFERENCES

California Department of Transportation (Caltrans), June 1983. *User's Instructions for SOUND32 (FHWA/CA-83/06).*

California Department of Transportation (Caltrans), 1987. *California Vehicle Noise Emission Levels, (FHWA/CA/TL-87/03).*

Dexter Wilson Engineers, January 7, 2005. *Conversation with Mr. Dexter Wilson.*

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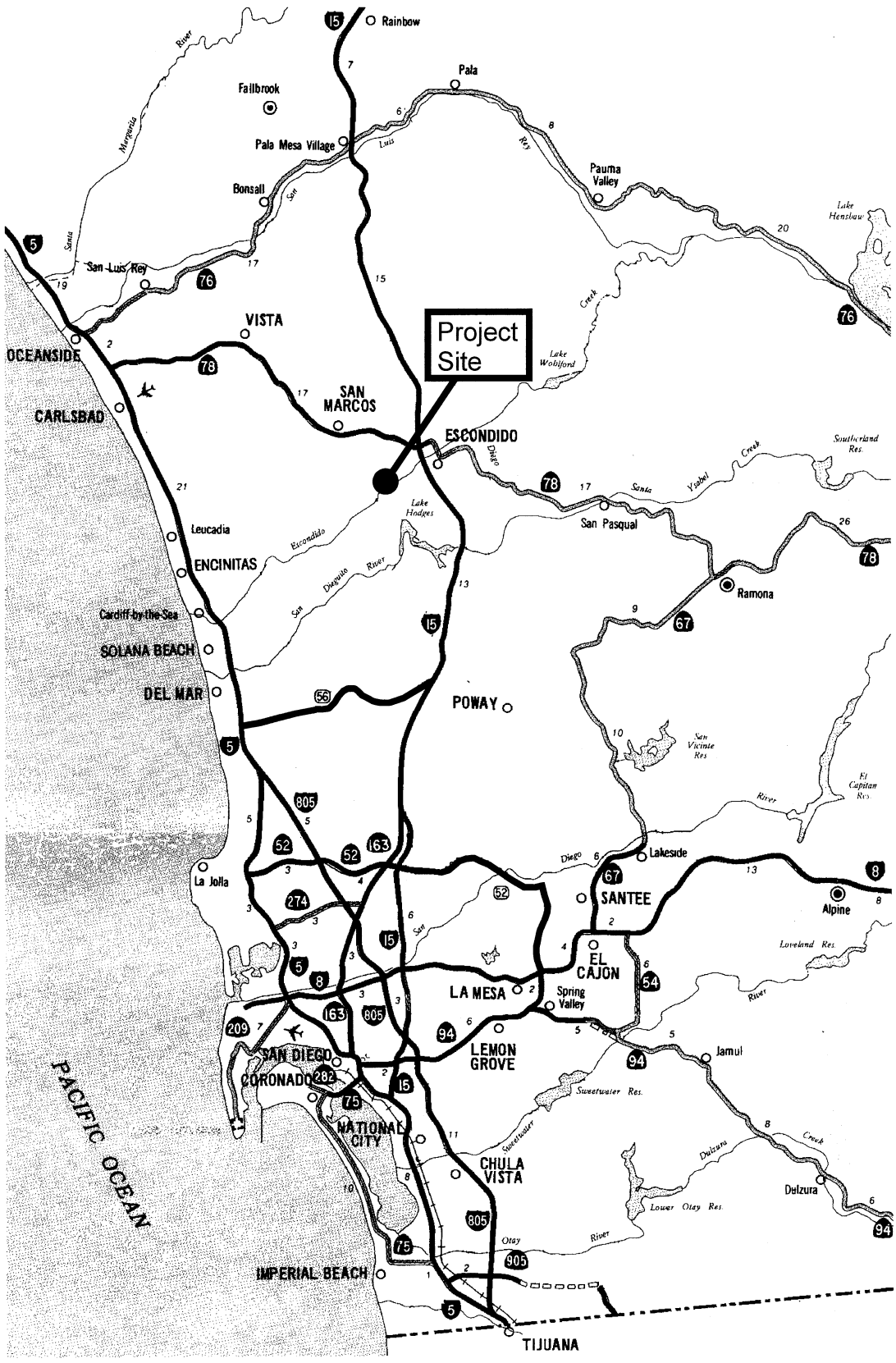
Linscott Law and Greenspan (LLG), February 28, 2006. *Traffic Impact Analysis Harmony Grove County of San Diego, California.*

Linscott Law and Greenspan (LLG), January, 2006. *Memo Avenida del Diablo Potential Impacts.*

San Diego, County of, December 17, 1980. *San Diego County General Plan Noise Element.*

San Diego, County of, February 2004. *San Diego County Code of Regulatory Ordinances Chapter 4, Noise Abatement and Control (as amended January 2, 2004).*

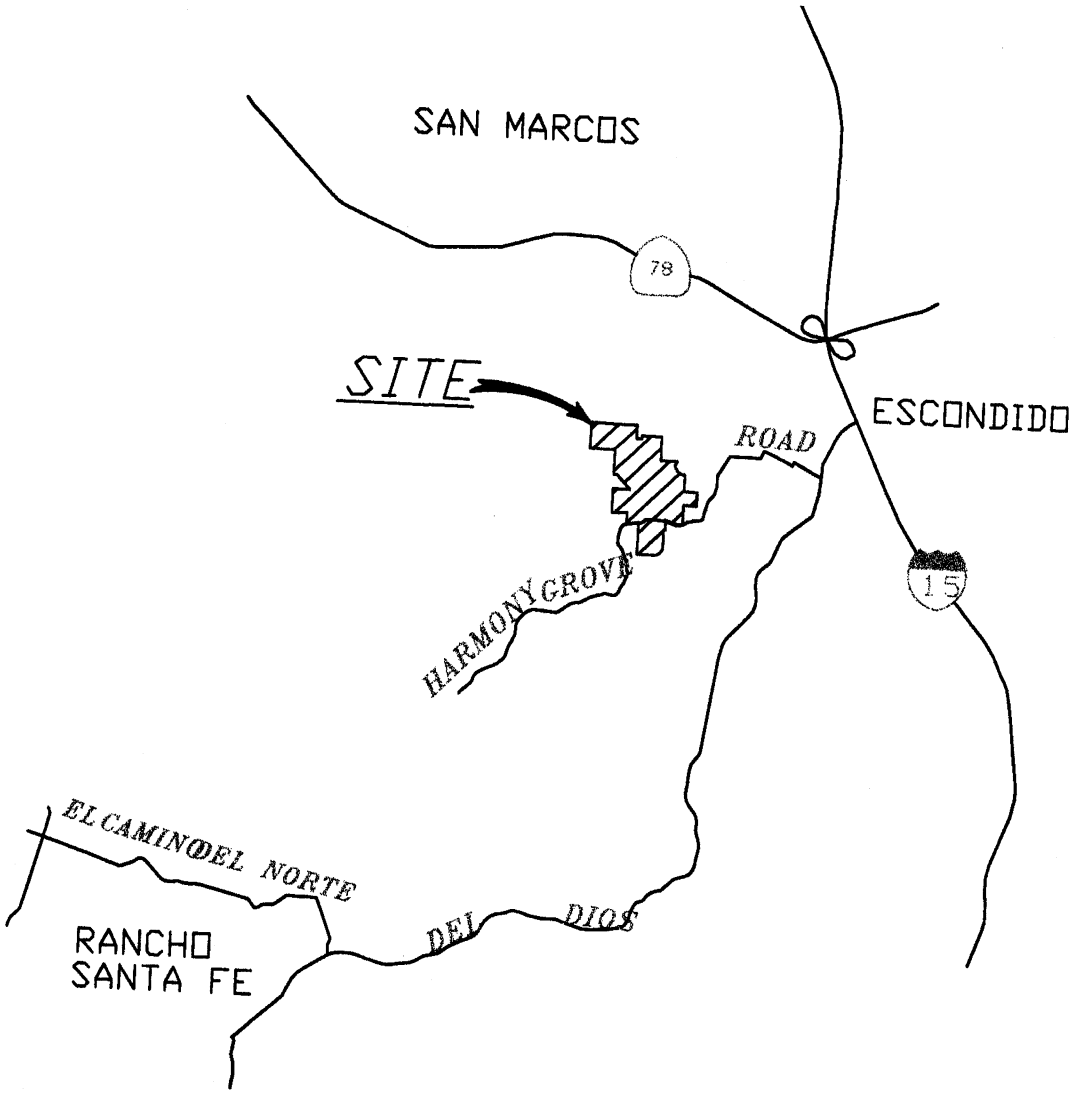


No Scale

Pacific Noise Control

Regional Location

FIGURE 1



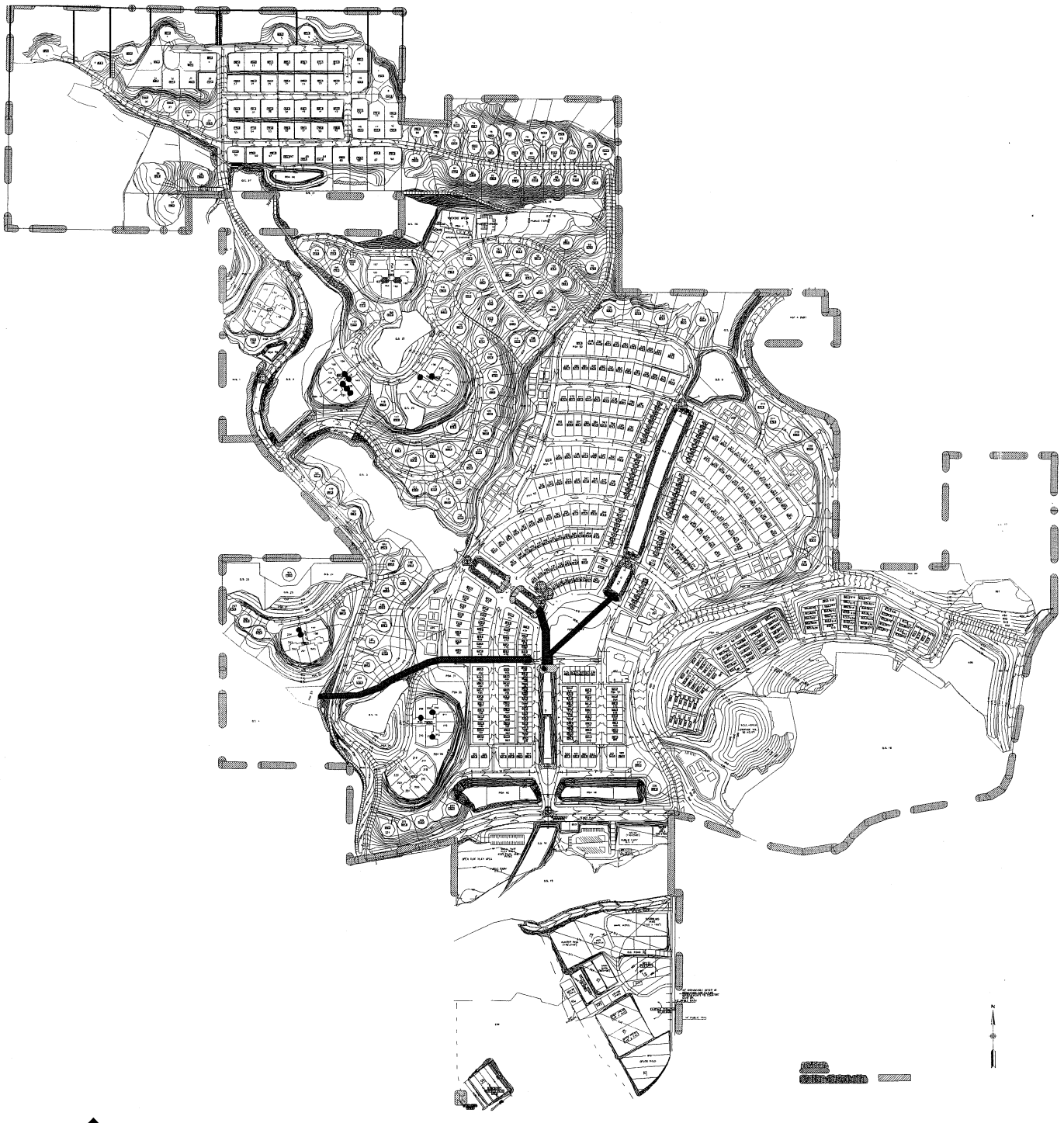
No Scale

Base Map Source: Rick Engineering

Pacific Noise Control

Project Location

FIGURE 2



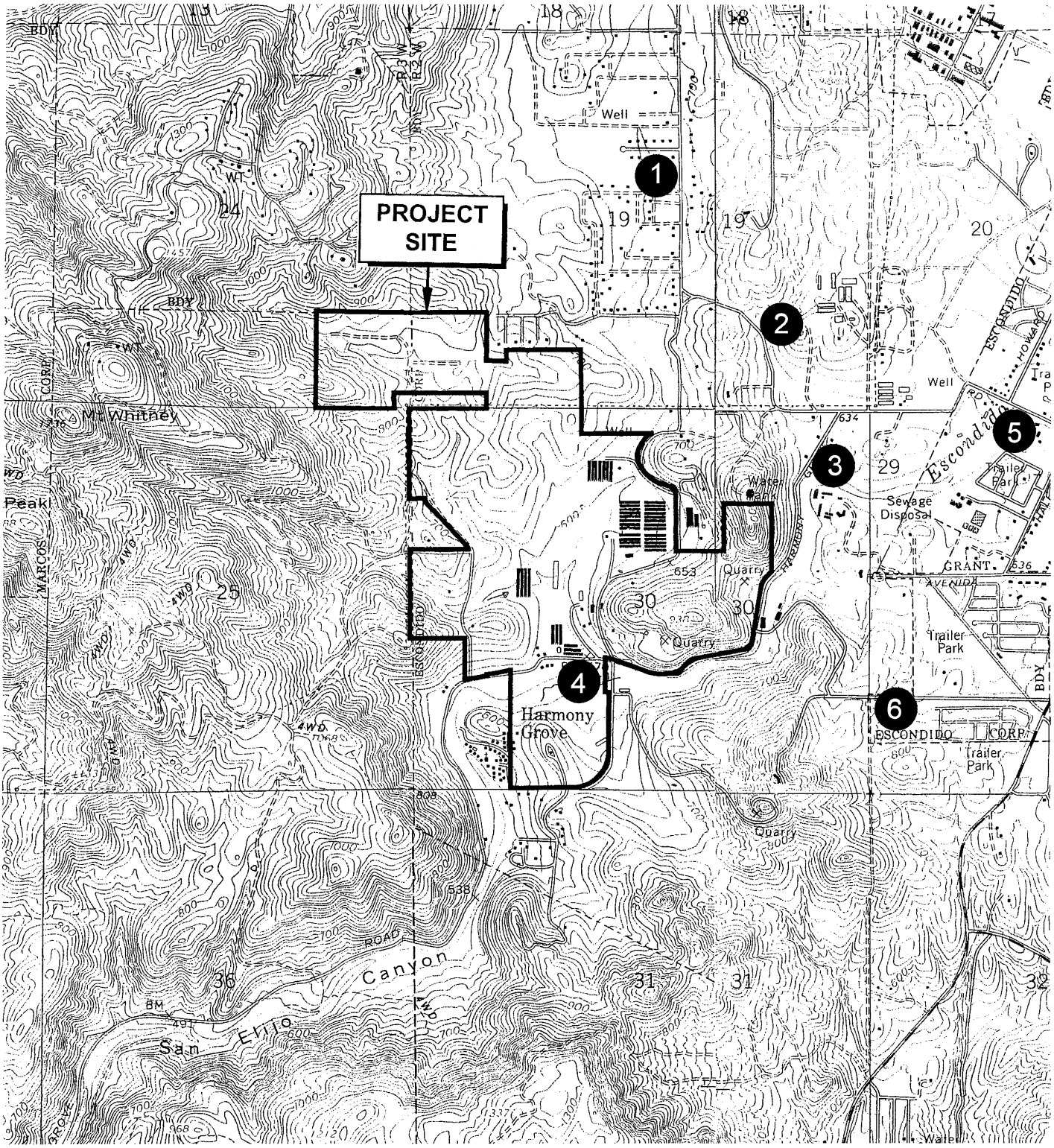
0 FEET 900

Base Map Source: Rick Engineering, 2006

Pacific Noise Control

Site Plan

FIGURE 3

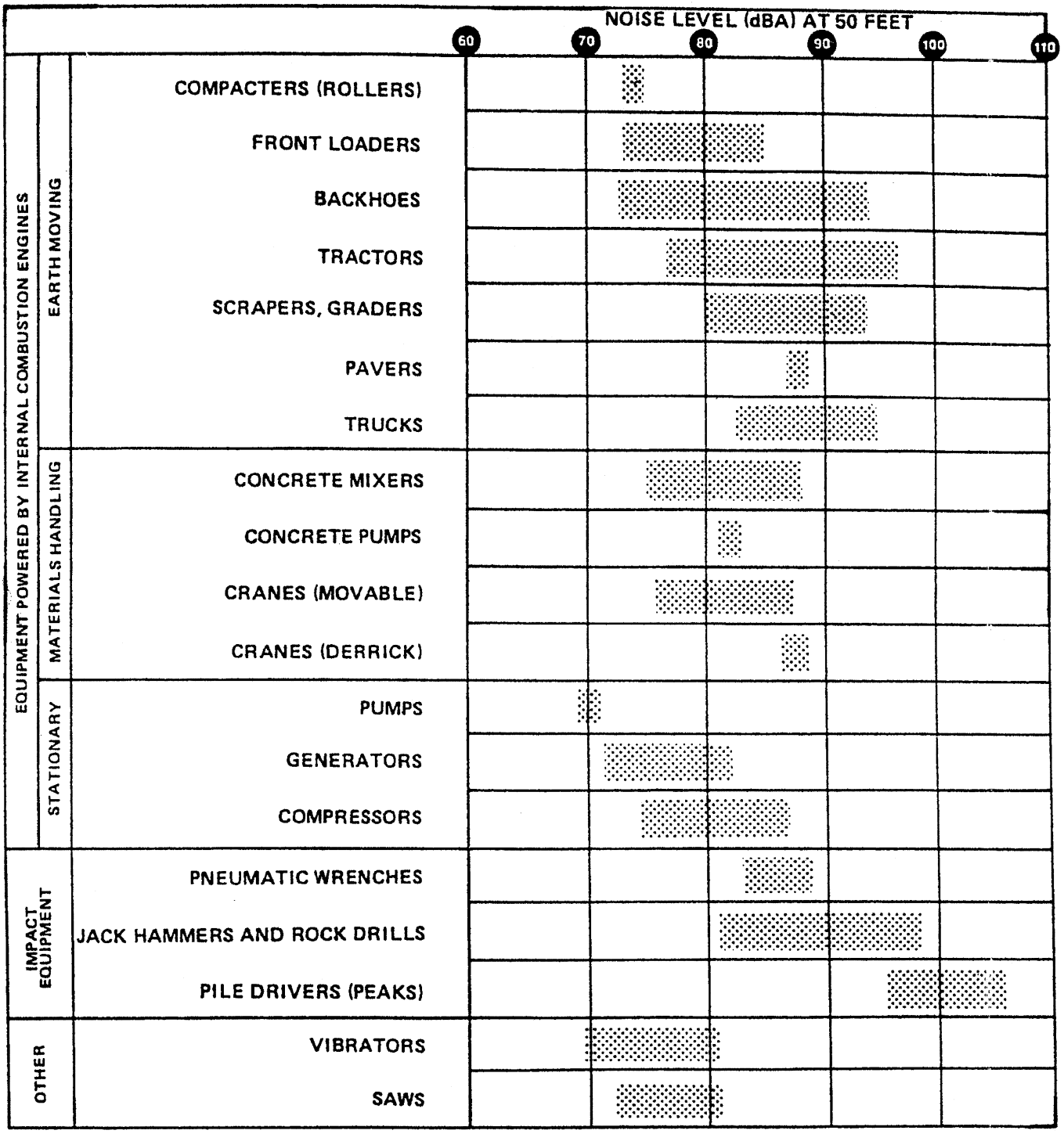


Base Map Source: USGS Rancho Santa Fe, Escondido Quadrangles

Pacific Noise Control

Noise Measurement Locations

FIGURE 4



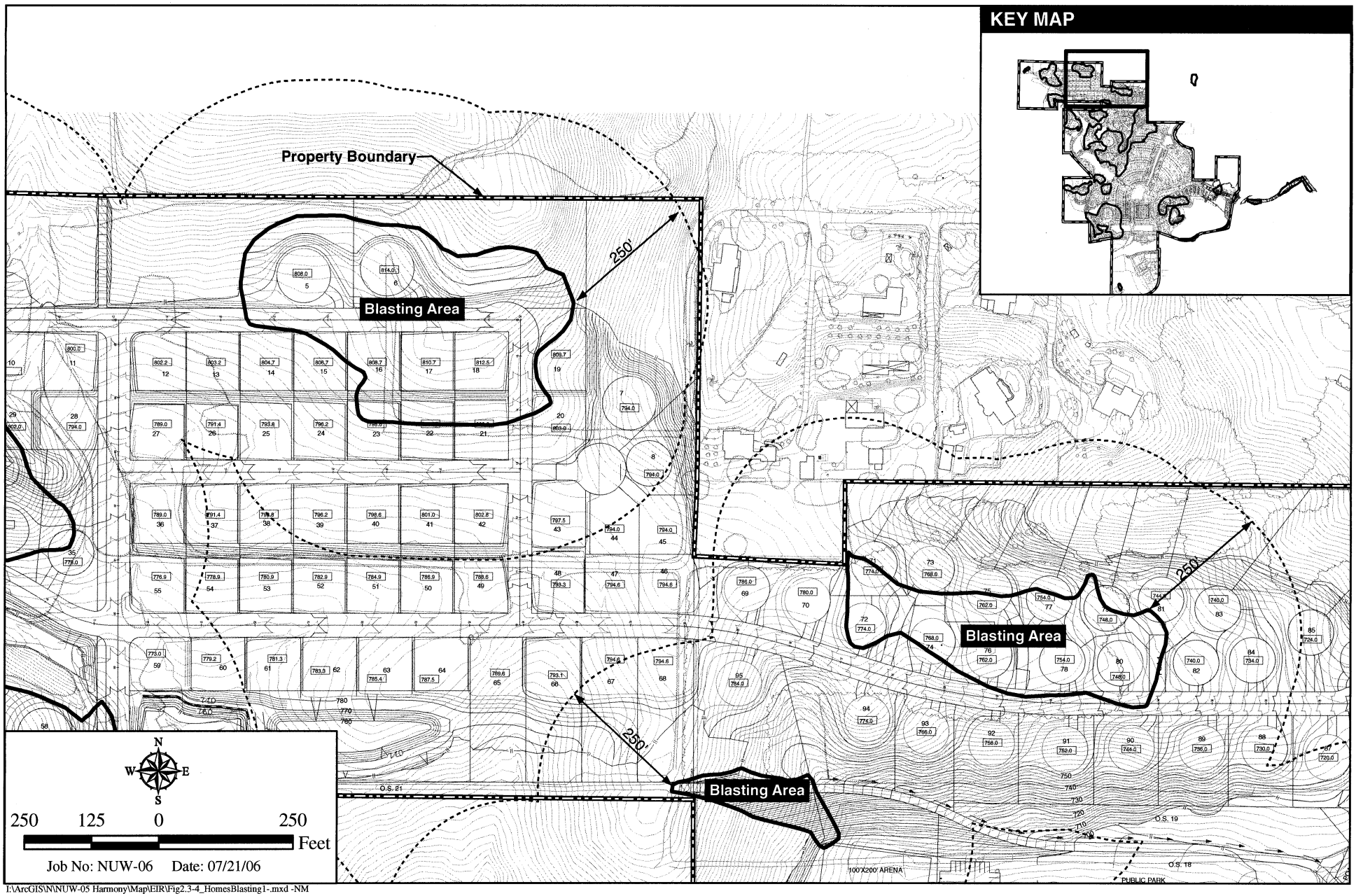
NOTE: Based on limited available data samples.

Source: EPA PB 206717, 12/31/71, "Noise from Construction Equipment and Operations"

Pacific Noise Control

Construction Equipment Noise Levels

FIGURE 5



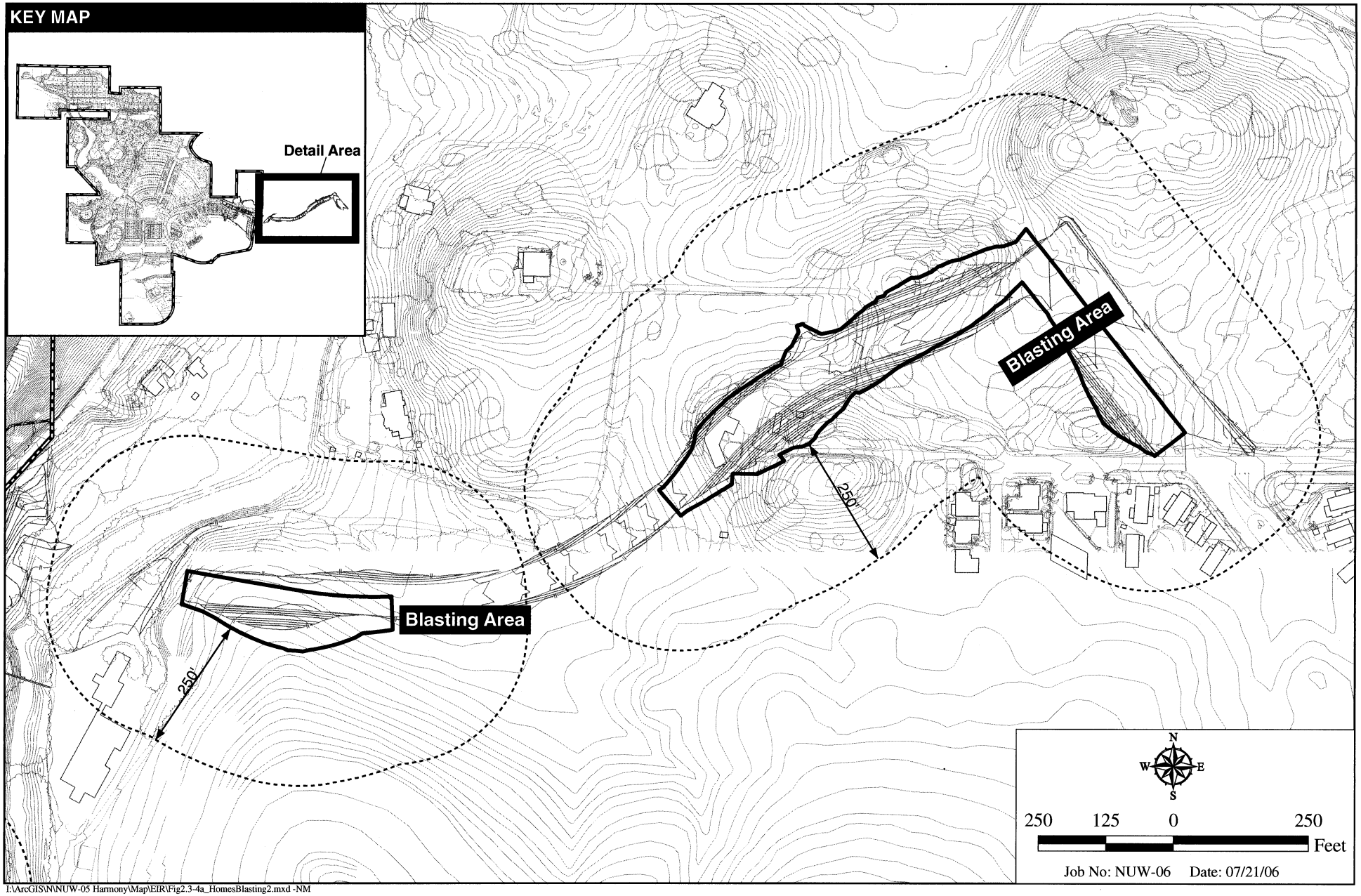
I:\ArcGIS\N\NUW-05 Harmony\Map\EIR\Fig2.3-4_HomesBlasting1-.mxd -NM

Location of Existing Homes Adjacent to Blasting Area

HARMONY GROVE VILLAGE

HELIX

Figure 6A



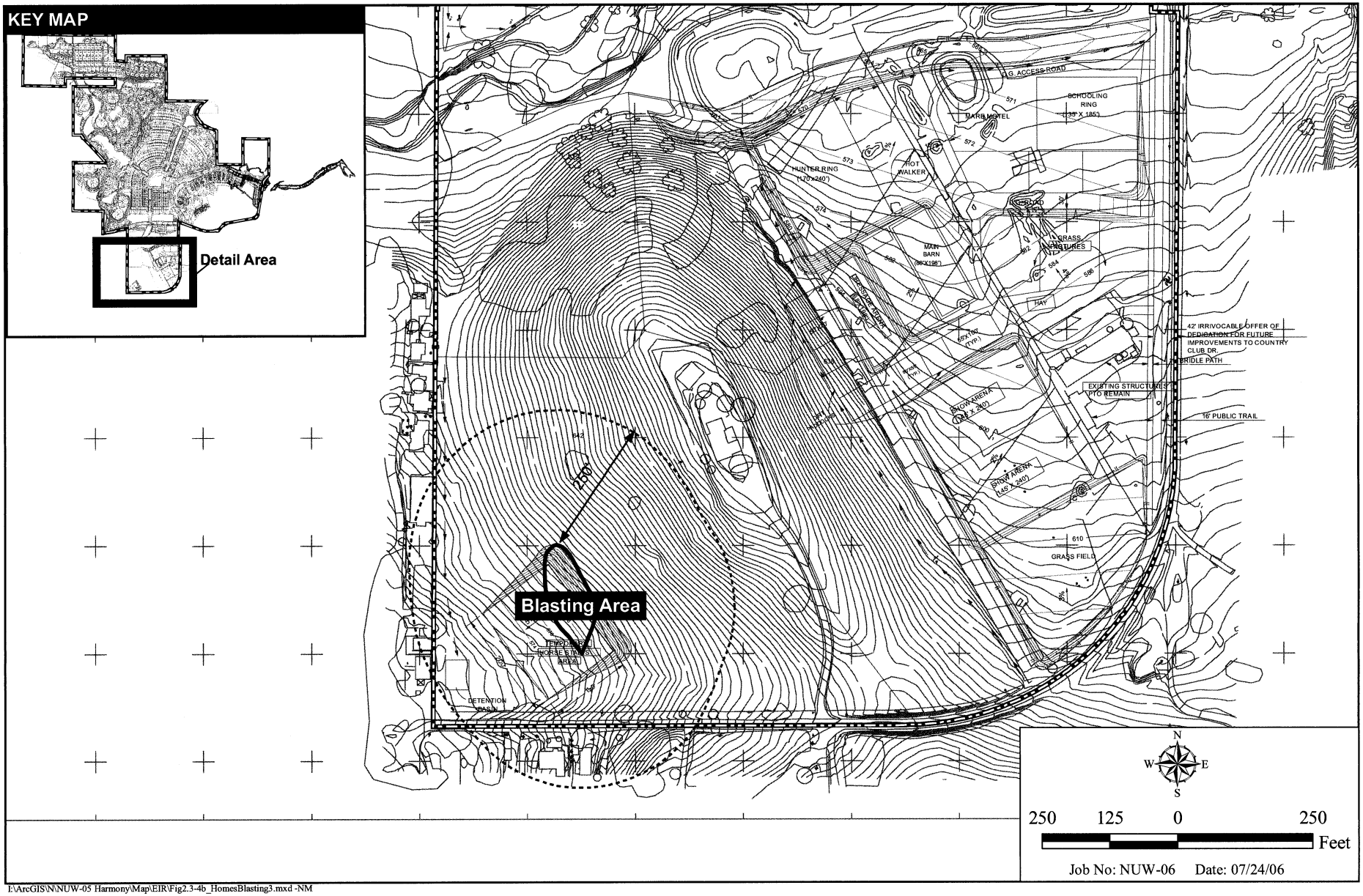
I:\ArcGIS\N\NUW-05 Harmony\Map\EIR\Fig2.3-4a_HomesBlasting2.mxd -NM

Location of Existing Homes Adjacent to Blasting Area - Off-site Village Road

HARMONY GROVE VILLAGE

HELIX

Figure 6B



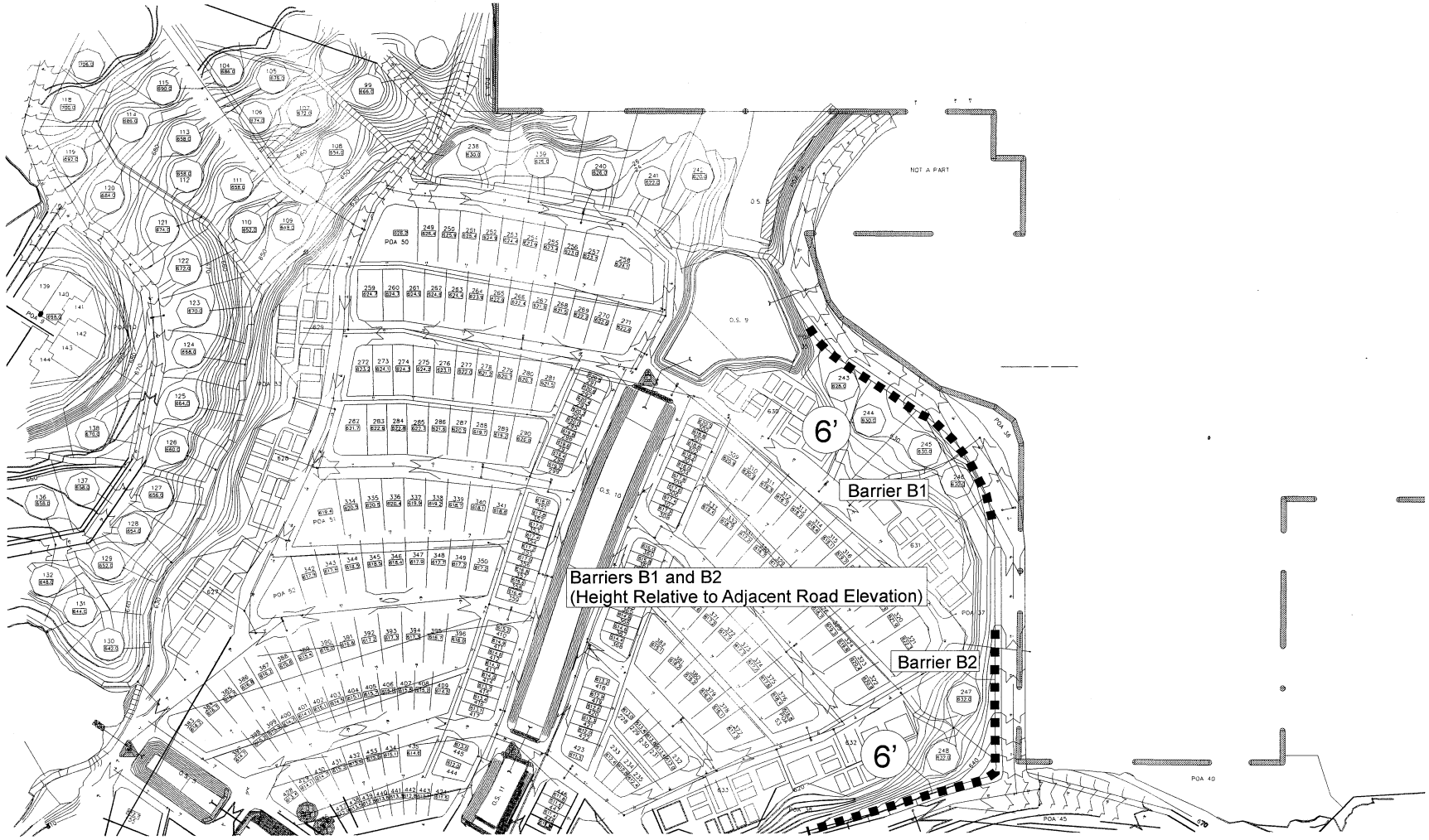
I:\ArcGIS\N\NUW-05 Harmony\Map\EIR\Fig2.3-4b_HomesBlasting3.mxd -NM

Location of Existing Homes Adjacent to Blasting Area

HARMONY GROVE VILLAGE

HELIX

Figure 6C



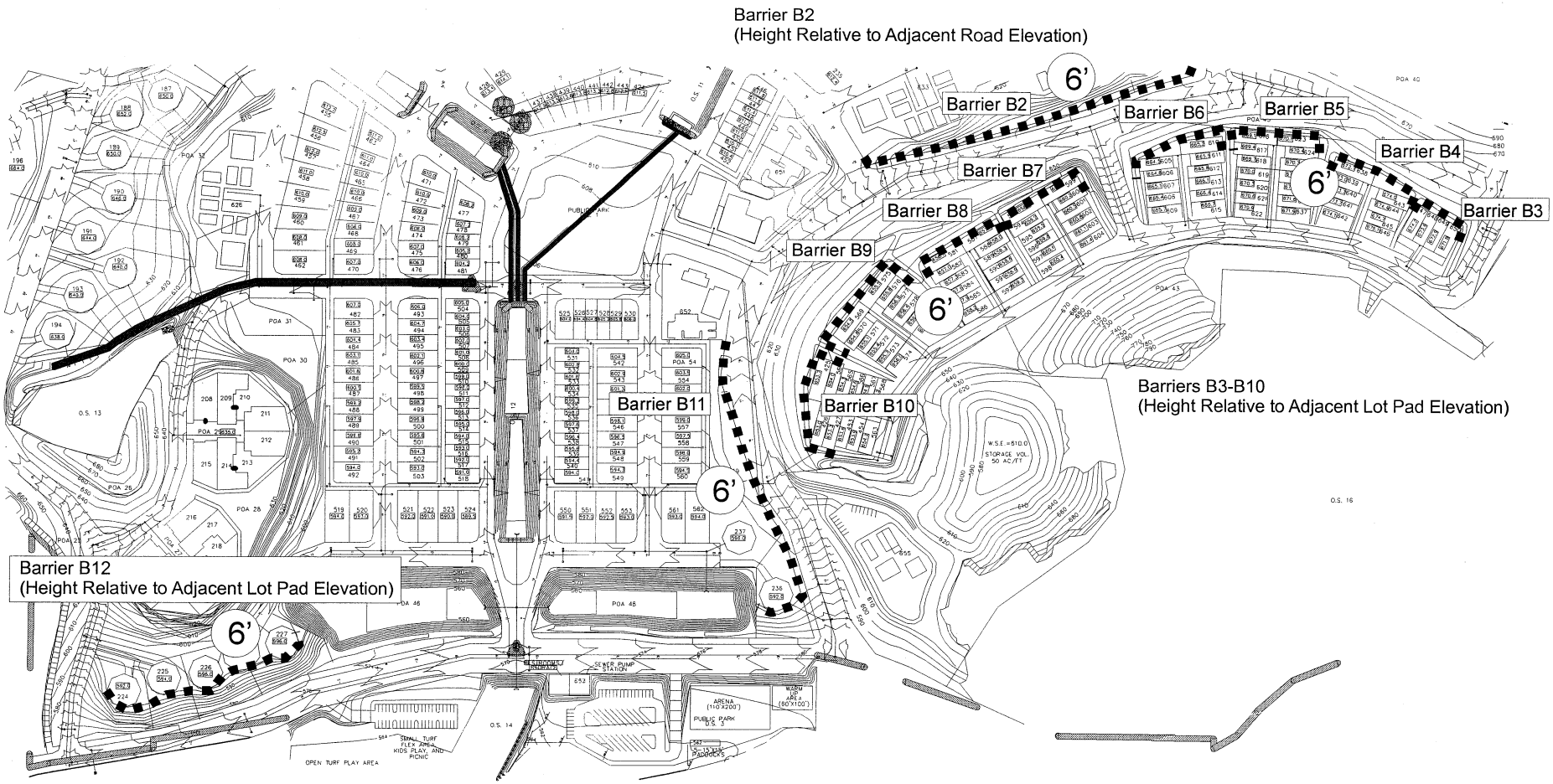
0 FEET 400

Base Map Source: Rick Engineering 2006

Pacific Noise Control

Noise Barrier Height and Locations

FIGURE 7A

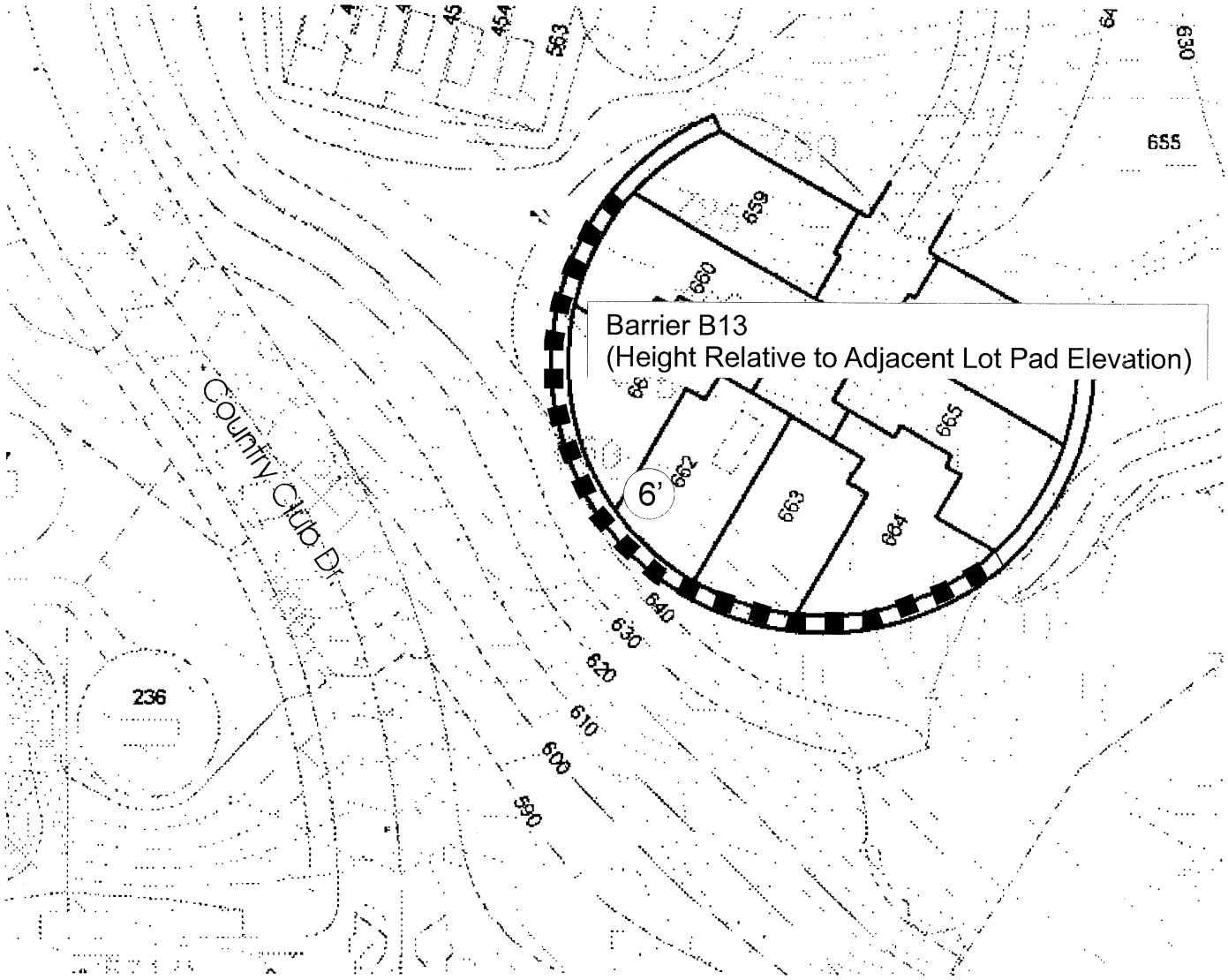


Base Map Source: Rick Engineering, 2006

Pacific Noise Control

Noise Barrier Heights and Locations

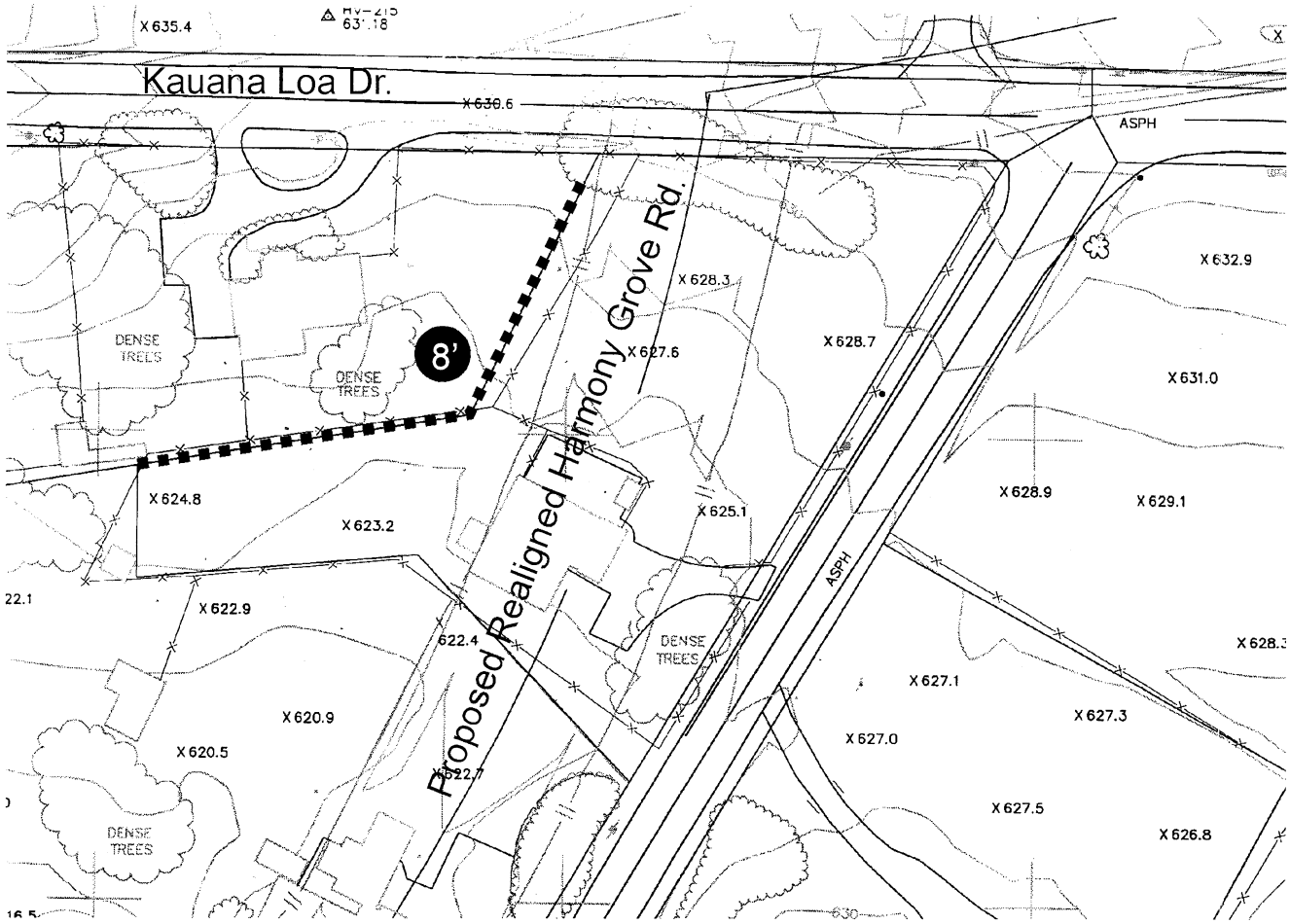
FIGURE 7B



0 FEET 100

Base Map Source: Rick Engineering, 2006

Pacific Noise Control **Preliminary Noise Barrier Height and Location** FIGURE 7C

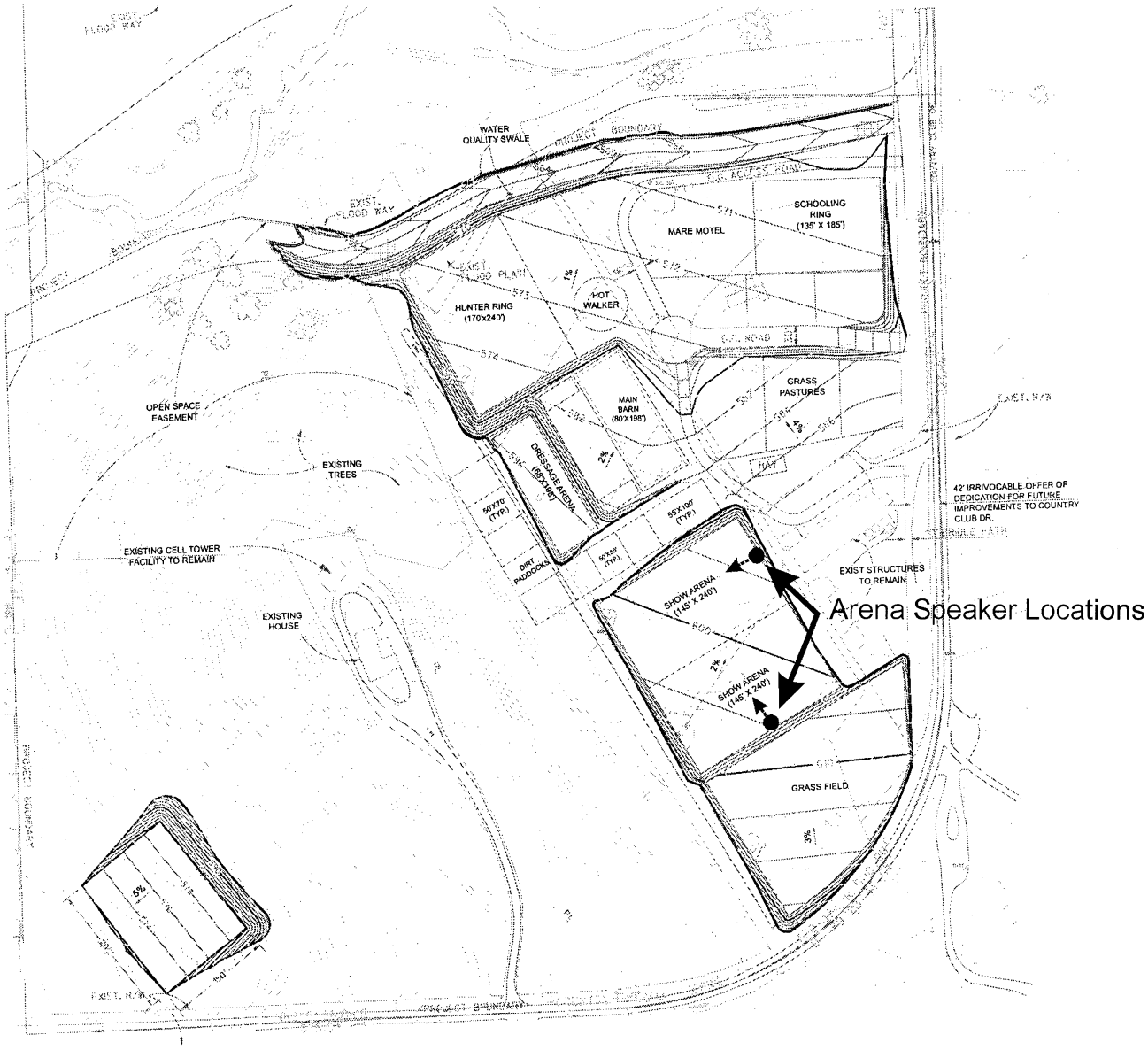


Base Map Source: Rick Engineering 2005

Pacific Noise Control

Preliminary Permanent Noise Barrier Height and Location

FIGURE 8



0 FEET 250

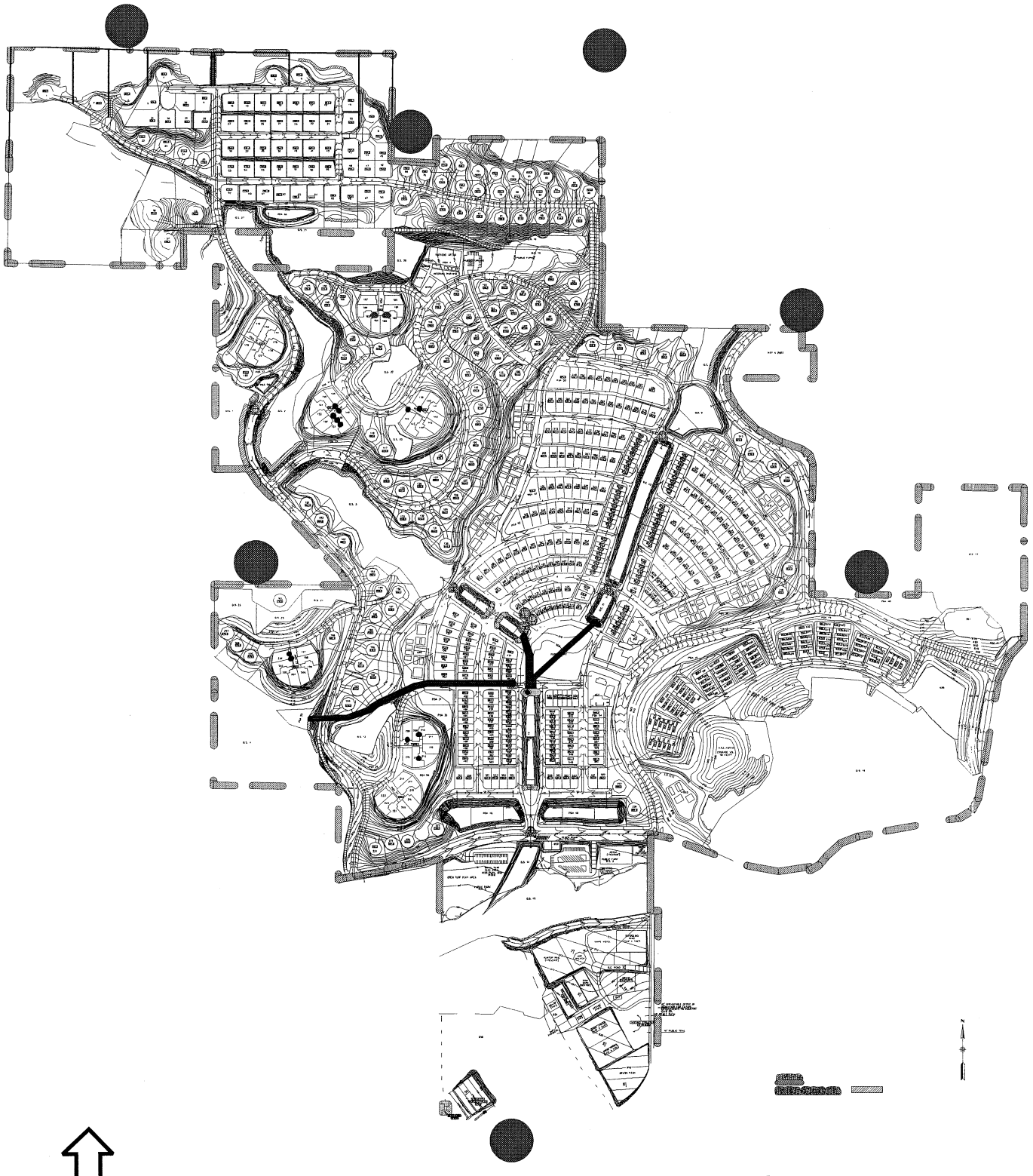
Note: Three speakers would also located inside barn or outside facing down

Base Map Source: Rick Engineering, September 2004

Pacific Noise Control

Potential Arena PA Speaker Locations and Front Orientations

FIGURE 9

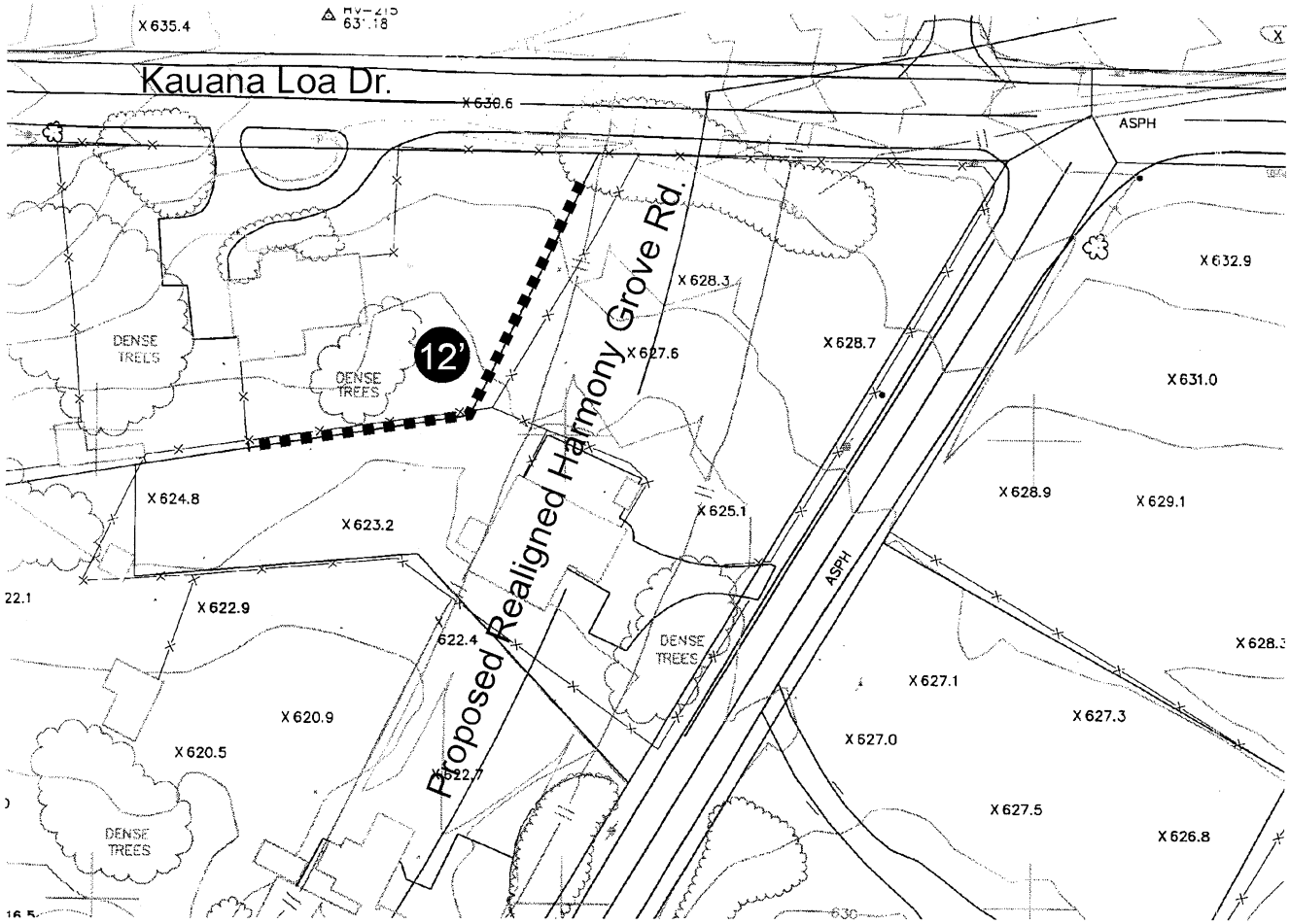


Base Map Source: Rick Engineering, 2006

Pacific Noise Control

Potential Construction Noise Monitoring Locations

FIGURE 10

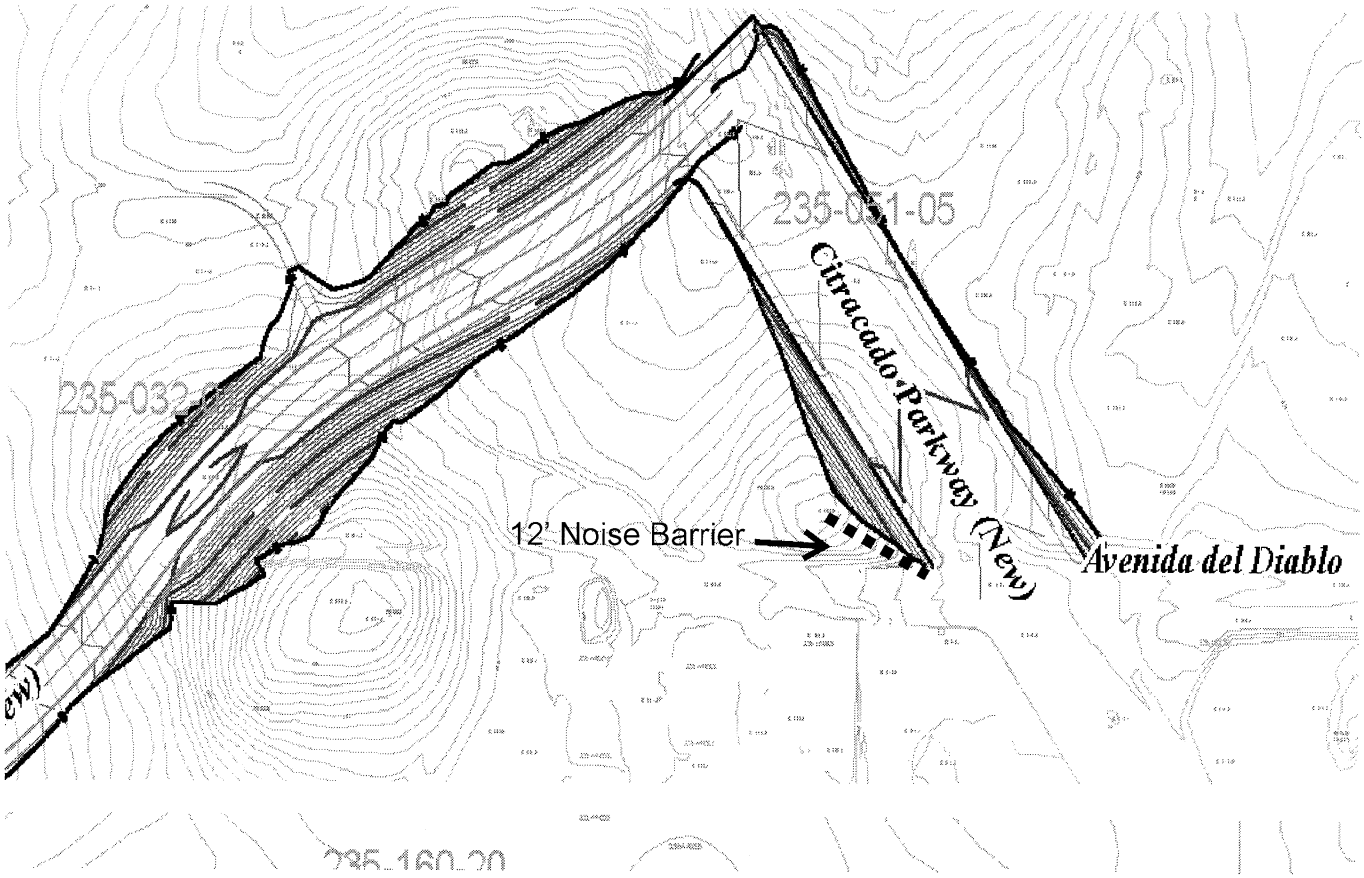


Base Map Source: Rick Engineering 2005

Pacific Noise Control

Temporary Noise Barrier Height and Location

FIGURE 11



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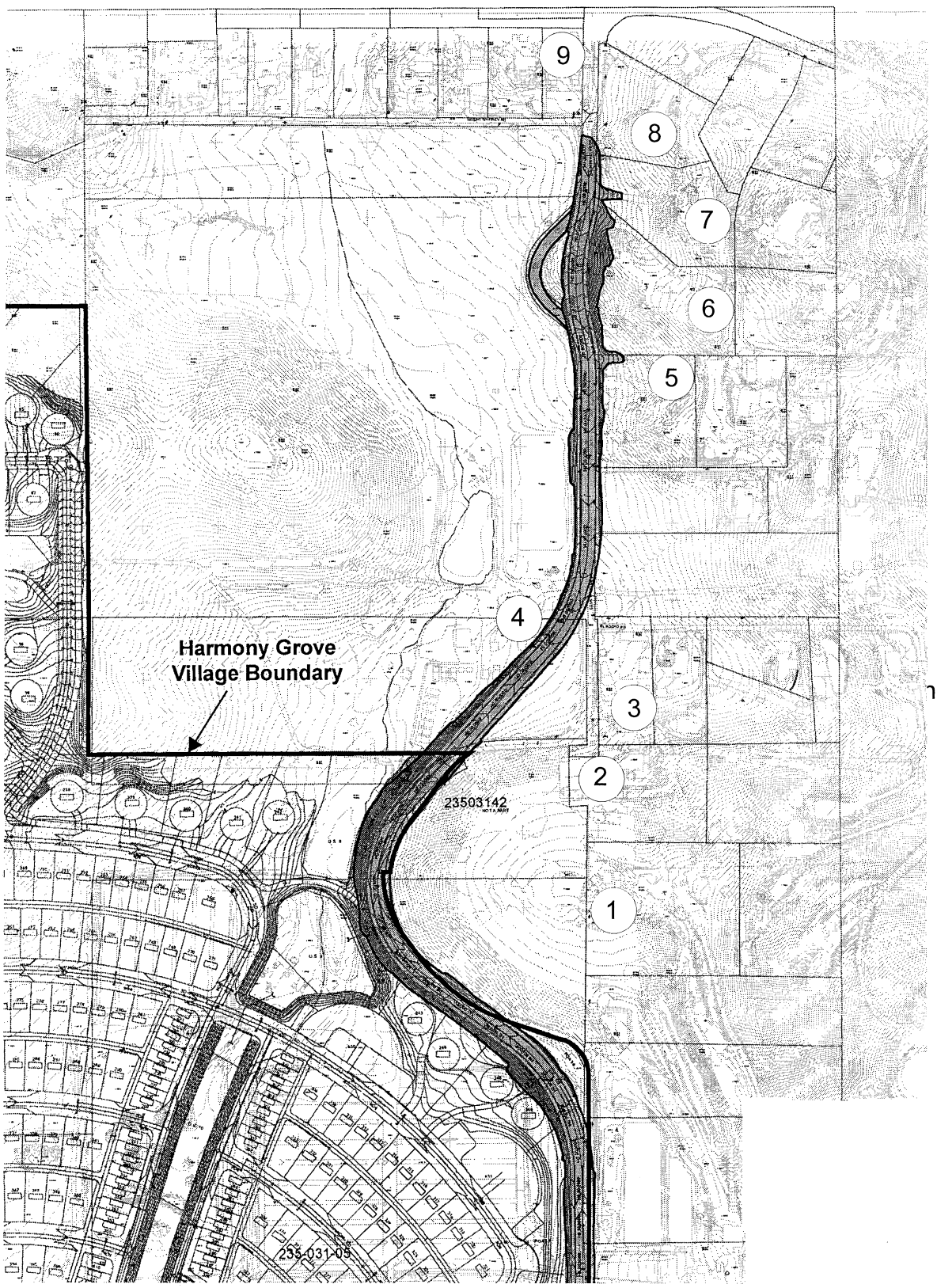
Base Map Source: Rick Engineering

Pacific Noise Control

Temporary Noise Barrier Height and Location

FIGURE 12



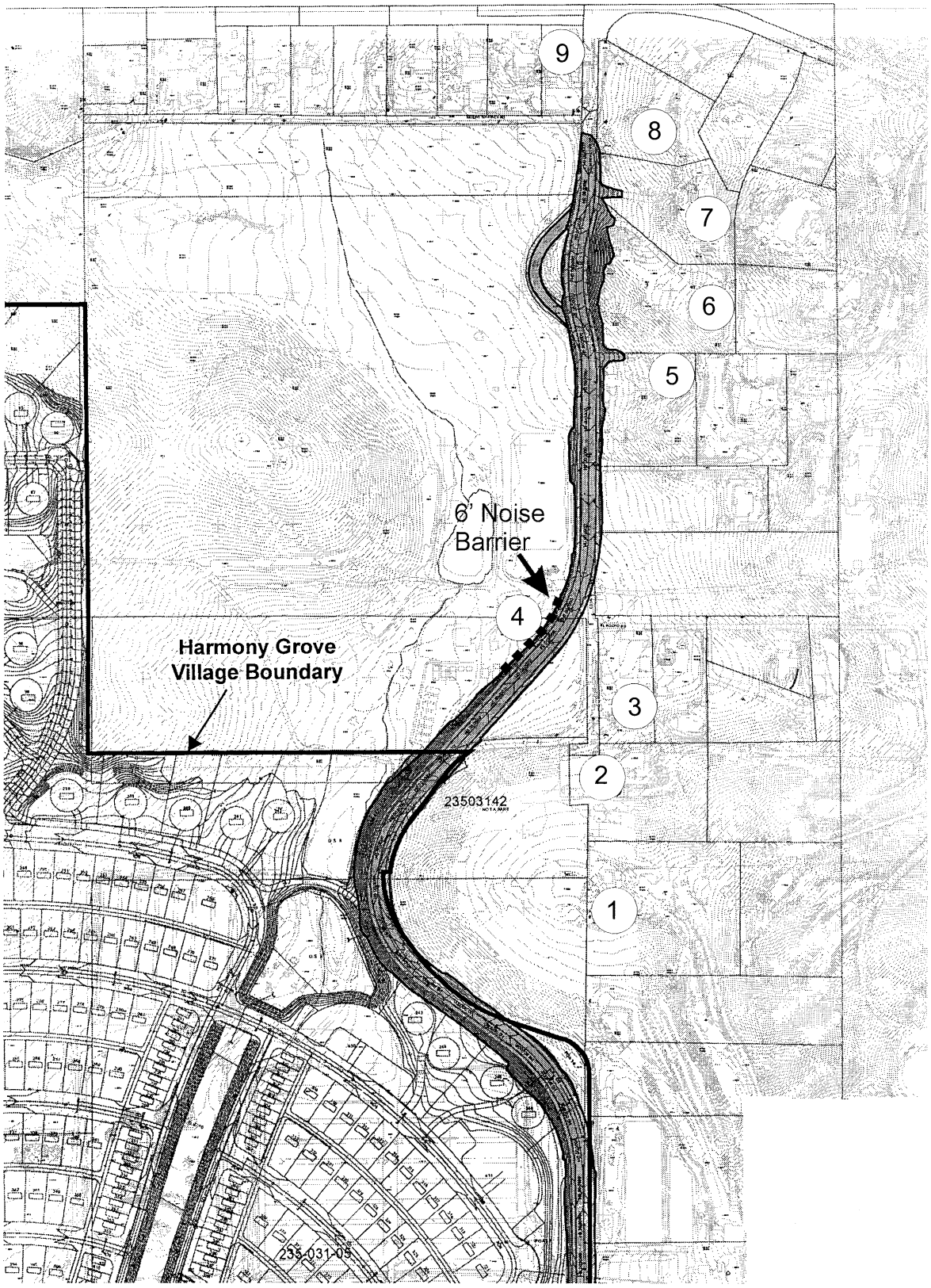
0 FEET 400

Base Map Source: Rick Engineering, May 2006

Pacific Noise Control

Off Site Noise Receptor Locations
Adjacent to Country Club Drive

FIGURE 13



0 FEET 400

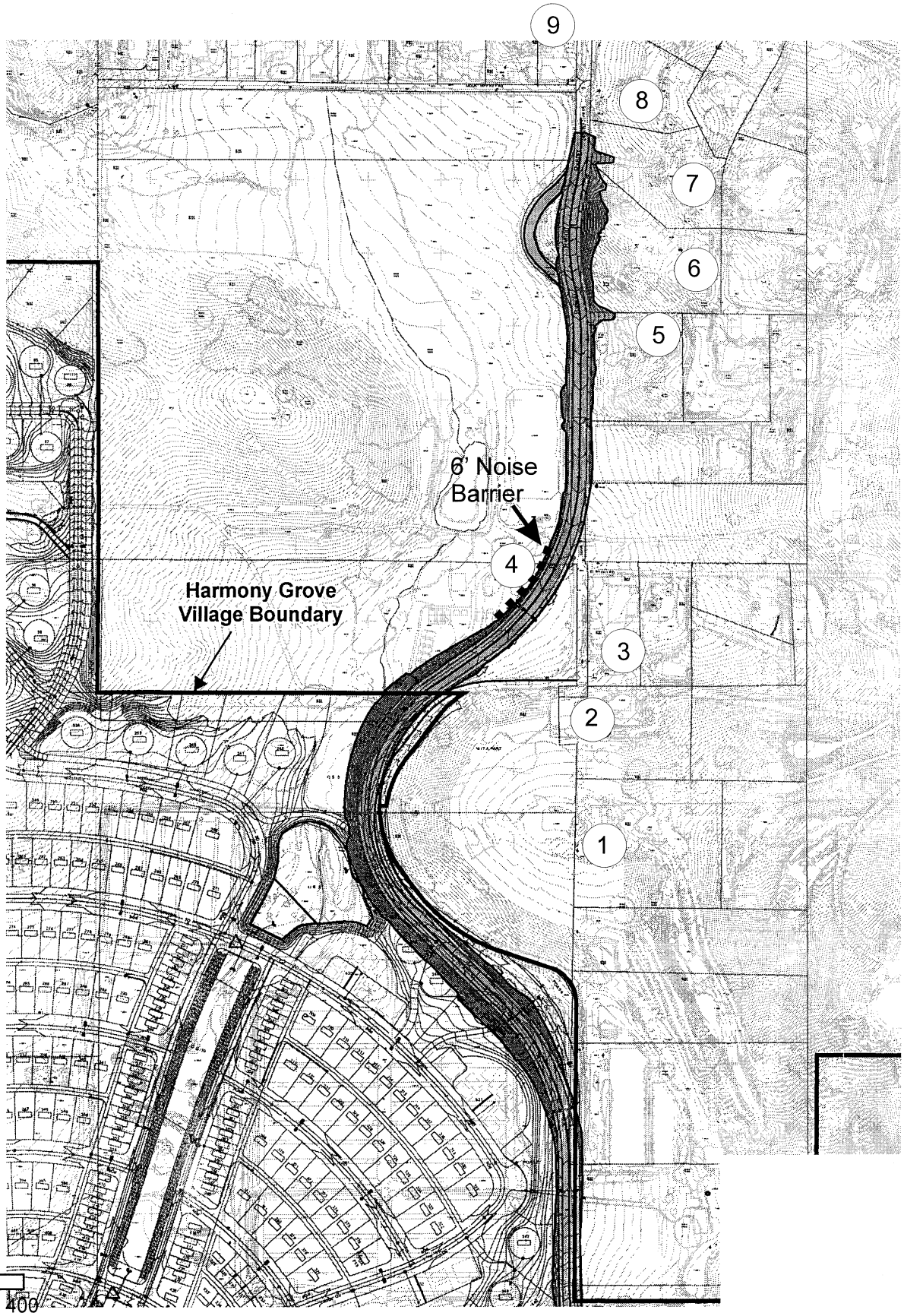
Base Map Source: Rick Engineering, May 2006

30 MPH ALTERNATIVE

Pacific Noise Control

Preliminary Noise Barrier Height and Location

FIGURE 14



Base Map Source: Rick Engineering, May 2006

35 MPH ALTERNATIVE

Pacific Noise Control

Preliminary Noise Barrier Height and Location

FIGURE 15

ATTACHMENT 1

DEFINITIONS

Term	Definition
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Community Noise Equivalent Level, CNEL	CNEL is the A-weighted equivalent continuous sound exposure level for a 24-hour period with a ten dB adjustment added to sound levels occurring during nighttime hours (10 pm to 7 am) and a five dB adjustment added to the sound levels occurring during the evening hours (7 pm to 10 pm).
Decibel, dB	A unit for measuring sound pressure level and is equal to 10 times the logarithm to the base 10 of the ratio of the measured sound pressure squared to a reference pressure, which is 20 micropascals.
Equivalent Continuous Sound Level	The sound level corresponding to a steady state level containing the same total energy as a time varying signal over a given sample period. L_{eq} is designed to average all of the loud and quiet sound levels occurring over a time period.

ATTACHMENT 2

SOUND32 INPUT/OUTPUT

```
Harmony Grove Village --Future-- (HG.FUT)
T-Harmony Grove Road, 1
 364 , 40 , 23 , 40 , 13 , 40
T-Harmony Grove Road, 2
 364 , 40 , 23 , 40 , 13 , 40
T-Country Club Drive, 3
 455 , 30 , 29 , 30 , 16 , 30
T-Country Club Drive, 4
 455 , 30 , 29 , 30 , 16 , 30
T-Country Club Drive (n/o V. Rd, 5
 342 , 30 , 21 , 30 , 12 , 30
T-Country Club Drive (n/o V.Rd., 6
 342 , 30 , 21 , 30 , 12 , 30
T-Country Club Drive, 7
 455 , 30 , 29 , 30 , 16 , 30
T-Country Club Drive, 8
 455 , 30 , 29 , 30 , 16 , 30
T-Country Club Drive (n/o V. Rd, 9
 342 , 30 , 21 , 30 , 12 , 30
T-Country Club Drive (n/o V.Rd., 10
 342 , 30 , 21 , 30 , 12 , 30
T-Village Drive, 11
 296 , 30 , 19 , 30 , 10 , 30
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6292721.8,1983438,636,636,
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R, 2 , 67 ,500
6290440.2,1980990.6,601.,r2/226
R, 3 , 67 ,500
6290645.3,1981075.4,601.,r3/227
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R, 6 , 67 ,500
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R, 7 , 67 ,500
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R, 11 , 67 ,500
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R, 12 , 67 ,500
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R, 13 , 67 ,500
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R, 14 , 67 ,500
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R, 15 , 67 ,500
6292536,1983546,633.,r15/243
R, 16 , 67 ,500
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6293278,1982314,678.,r27/638
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6292523,1982483,626.,632
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C,C

28	-	0.*
29	-	0.*
30	-	0.*
31	-	0.*
32	-	0.*
33	-	0.*
34	-	0.*
35	-	0.*
36	-	0.*
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39	-	0.*
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41	-	0.*
42	-	0.*
43	-	0.*
44	-	0.*
45	-	0.*
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47	-	0.*
48	-	0.*
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50	-	0.*
51	-	0.*
52	-	0.*
53	-	0.*
54	-	0.*
55	-	0.*
56	-	0.*
57	-	0.*
58	-	0.*
59	-	0.*
60	-	0.*

B5 P3	185.0	MASONRY
B5 P4	142.2	MASONRY
B5 P5	71.8	MASONRY
B5 P6	72.7	MASONRY
B5 P7	86.5	MASONRY
B5 P8	85.7	MASONRY
B6 P1	111.0	MASONRY
B6 P2	122.2	MASONRY
b47	81.3	MASONRY
B6 P4	76.7	MASONRY
B6 P5	175.0	MASONRY
B6 P6	122.3	MASONRY
B6 P7	79.2	MASONRY
B6 P8	109.6	MASONRY
B6 P9	103.4	MASONRY
B7 P1	62.2	MASONRY
B7 P2	112.1	MASONRY
B7 P3	137.4	MASONRY
B7 P4	255.4	MASONRY
B7 P5	99.5	MASONRY
B7 P6	236.1	MASONRY
B7 P7	206.2	MASONRY
B7 P8	64.2	MASONRY
B8 P1	69.6	MASONRY
B8 P2	229.5	MASONRY
B8 P3	144.2	MASONRY
B8 P4	110.7	MASONRY
B8 P5	70.2	MASONRY
B8 P6	101.2	MASONRY
B8 P7	110.9	MASONRY
B8 P8	138.4	MASONRY
B8 P9	27.3	MASONRY
B8 P10	55.5	MASONRY

0 1 2 3 4 5 6 7

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	r1/224	67.	500.	63.2
2	r2/226	67.	500.	64.1
3	r3/227	67.	500.	64.1
4	r4/236	67.	500.	65.4
5	r5/237	67.	500.	61.0
6	r6/559	67.	500.	58.7
7	r7/557	67.	500.	58.8
8	r8/555	67.	500.	59.7
9	r9/poa54	67.	500.	61.3
10	r10/248	67.	500.	60.5
11	r11/247	67.	500.	61.5
12	r12/246	67.	500.	62.8
13	r13/245	67.	500.	62.6
14	r14/244	67.	500.	61.8
15	r15/243	67.	500.	63.3
16	r16/242	67.	500.	56.0
17	r20/426	67.	500.	61.1
18	r21/425	67.	500.	60.8
19	r22/575	67.	500.	61.0

20	r23/587	67.	500.	61.9
21	r24/599	67.	500.	64.5
22	r25/610	67.	500.	64.0
23	r26/616	67.	500.	63.6
24	r27/638	67.	500.	63.3
25	r28/643	67.	500.	63.8
26	r29/650	67.	500.	58.8
27	630	67.	500.	58.2
28	631	67.	500.	59.2
29	632	67.	500.	59.9
30	633	67.	500.	60.9

BARRIER TYPE	COST
BERM	0.
MASONRY	0.
MASONRY/JERSEY	0.
CONCRETE	0.
TOTAL COST = $	0.

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BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1
  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1
  1  1  1  1  1  1  1  1  1  1
CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
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Harmony Grove Village Mitigated (HG.MIT)
T-Harmony Grove Road, 1
364 , 40 , 23 , 40 , 13 , 40
T-Harmony Grove Road, 2
364 , 40 , 23 , 40 , 13 , 40
T-Country Club Drive, 3
455 , 30 , 29 , 30 , 16 , 30
T-Country Club Drive, 4
455 , 30 , 29 , 30 , 16 , 30
T-Country Club Drive (n/o V. Rd, 5
342 , 30 , 21 , 30 , 12 , 30
T-Country Club Drive (n/o V.Rd., 6
342 , 30 , 21 , 30 , 12 , 30
T-Country Club Drive, 7
455 , 30 , 29 , 30 , 16 , 30
T-Country Club Drive, 8
455 , 30 , 29 , 30 , 16 , 30
T-Country Club Drive (n/o V. Rd, 9
342 , 30 , 21 , 30 , 12 , 30
T-Country Club Drive (n/o V.Rd., 10
342 , 30 , 21 , 30 , 12 , 30
T-Village Drive, 11
296 , 30 , 19 , 30 , 10 , 30
T-Village Drive, 12
296 , 30 , 19 , 30 , 10 , 30
L-Eastbound, 1
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N,6290109.2,1980778,570,
N,6290261.0,1980804,572,
N,6290380.1,1980825,574,
N,6290502.3,1980862,576,
N,6290725.9,1980966,576,
N,6290880.8,1981021,574,
N,6291043.0,1981046,572,
N,6291357.0,1981047,572,
N,6291640.9,1981047,576,
N,6292003.1,1981047,580,
N,6292138.3,1981002,578,
L-Westbound, 2
N,6289963.3,1980781,568,
N,6290104.9,1980804,570,
N,6290256.6,1980830,572,
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N,6290493.0,1980886,576,
N,6290716.0,1980990,576,
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N,6291041.0,1981071,572,
N,6291356.9,1981073,572,
N,6291640.9,1981073,576,
N,6292007.3,1981073,580,
N,6292142.4,1981014,578,
L-Northbound, 3
N,6292018.2,1981060,580,
N,6292018.5,1981135,582,
N,6292001.3,1981251,590,
N,6291962.7,1981351,600,
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N,6291835.7,1981549,614,
N,6291801.5,1981634,615,

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N,6291783.2,1981816,610,
N,6291811.7,1981943,606,
L-Northbound, 4
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N,6292006.5,1982186,614,
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N,6292523.1,1982332,640,
N,6292712.4,1982397,642,
N,6292867.6,1982448,644,
N,6292958.1,1982462,647,
L-Northbound, 5
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N,6292821.1,1983424,635,
N,6292763.6,1983473,636,
L-Northbound, 6
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N,6292584.1,1983595,630,
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N,6292437.3,1983952,622,
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N,6292531.7,1984102,628,
N,6292599.3,1984175,632,
L-Southbound, 7
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N,6291776.5,1981627,615,
N,6291757.6,1981721,614,
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L-Southbound, 8
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L-Southbound, 9

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L-Southbound, 10
N,6292812.6,1983416,635,
N,6292756.4,1983463,636,
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N,6292411.2,1983840,622,
N,6292425.6,1983955,622,
N,6292460.5,1984028,624,
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L-Eastbound, 11
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6290663.8,1981121,596,602,
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6291853.0,1981179,592,598,11
6291897.6,1981211,592,598,12
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6291717.8,1981720,614,620,
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B-Barrier 4, 4 , 2 , 0 ,0
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6292721.8,1983438,636,642,
B-Barrier 6, 6 , 2 , 0 ,0
6292721.8,1983438,636,642,
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6292528.7,1983568,630,636,b47
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6292388.6,1983970,622,622,
6292421.6,1984042,624,624,
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6293576.8,1982140,672,678,79
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R, 2 , 67 ,500
6290440.2,1980990.6,601.,r2/226
R, 3 , 67 ,500
6290645.3,1981075.4,601.,r3/227
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R, 4 , 67 ,500
6291853,1981192.3,597.,r4/236
R, 5 , 67 ,500
6291796,1981390,601.,r5/237
R, 6 , 67 ,500
6291664,1981571,601.,r6/559
R, 7 , 67 ,500
6291664,1981651,604.,r7/557
R, 8 , 67 ,500
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R, 9 , 67 ,500
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R, 11 , 67 ,500
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R, 12 , 67 ,500
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6291948,1981626,658.,r20/426
R, 18 , 67 ,500
6291954,1981779,659.,r21/425
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6292086,1981993,661.,r22/575
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R, 22 , 67 ,500
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R, 29 , 67 ,500
6292523,1982483,626.,632
R, 30 , 67 ,500
6292192,1982366,625.,633
C,C

28	-	3.*	B5 P3	185.2	MASONRY
29	-	3.*	B5 P4	142.3	MASONRY
30	-	6.*	B5 P5	71.8	MASONRY
31	-	6.*	B5 P6	72.7	MASONRY
32	-	6.*	B5 P7	86.5	MASONRY
33	-	6.*	B5 P8	85.7	MASONRY
34	-	6.*	B6 P1	111.0	MASONRY
35	-	6.*	B6 P2	122.2	MASONRY
36	-	6.*	b47	81.3	MASONRY
37	-	3.*	B6 P4	77.1	MASONRY
38	-	0.*	B6 P5	175.0	MASONRY
39	-	0.*	B6 P6	122.3	MASONRY
40	-	0.*	B6 P7	79.2	MASONRY
41	-	0.*	B6 P8	109.6	MASONRY
42	-	0.*	B6 P9	103.4	MASONRY
43	-	6.*	B7 P1	62.2	MASONRY
44	-	6.*	B7 P2	112.1	MASONRY
45	-	6.*	B7 P3	137.4	MASONRY
46	-	6.*	B7 P4	255.4	MASONRY
47	-	6.*	B7 P5	99.5	MASONRY
48	-	6.*	B7 P6	236.1	MASONRY
49	-	6.*	B7 P7	206.2	MASONRY
50	-	6.*	B7 P8	64.2	MASONRY
51	-	6.*	70	69.6	MASONRY
52	-	6.*	71	229.5	MASONRY
53	-	6.*	72	144.2	MASONRY
54	-	6.*	73	110.7	MASONRY
55	-	6.*	74	70.2	MASONRY
56	-	6.*	75	101.2	MASONRY
57	-	6.*	76	110.9	MASONRY
58	-	6.*	77	138.4	MASONRY
59	-	6.*	78	27.3	MASONRY
60	-	6.*	79	55.5	MASONRY

0 1 2 3 4 5 6 7

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	r1/224	67.	500.	55.5
2	r2/226	67.	500.	56.1
3	r3/227	67.	500.	56.0
4	r4/236	67.	500.	59.2
5	r5/237	67.	500.	58.6
6	r6/559	67.	500.	56.7
7	r7/557	67.	500.	56.2
8	r8/555	67.	500.	56.4
9	r9/poa54	67.	500.	58.5
10	r10/248	67.	500.	55.9
11	r11/247	67.	500.	56.7
12	r12/246	67.	500.	57.1
13	r13/245	67.	500.	57.1
14	r14/244	67.	500.	58.0
15	r15/243	67.	500.	57.9
16	r16/242	67.	500.	55.9
17	r20/426	67.	500.	53.0
18	r21/425	67.	500.	52.8
19	r22/575	67.	500.	54.7

20	r23/587	67.	500.	54.7
21	r24/599	67.	500.	56.7
22	r25/610	67.	500.	56.5
23	r26/616	67.	500.	56.0
24	r27/638	67.	500.	56.1
25	r28/643	67.	500.	56.3
26	r29/650	67.	500.	53.7
27	630	67.	500.	54.9
28	631	67.	500.	56.7
29	632	67.	500.	55.4
30	633	67.	500.	56.6

BARRIER TYPE	COST
BERM	0.
MASONRY	300018.
MASONRY/JERSEY	0.
CONCRETE	0.

TOTAL COST = $ 300000.

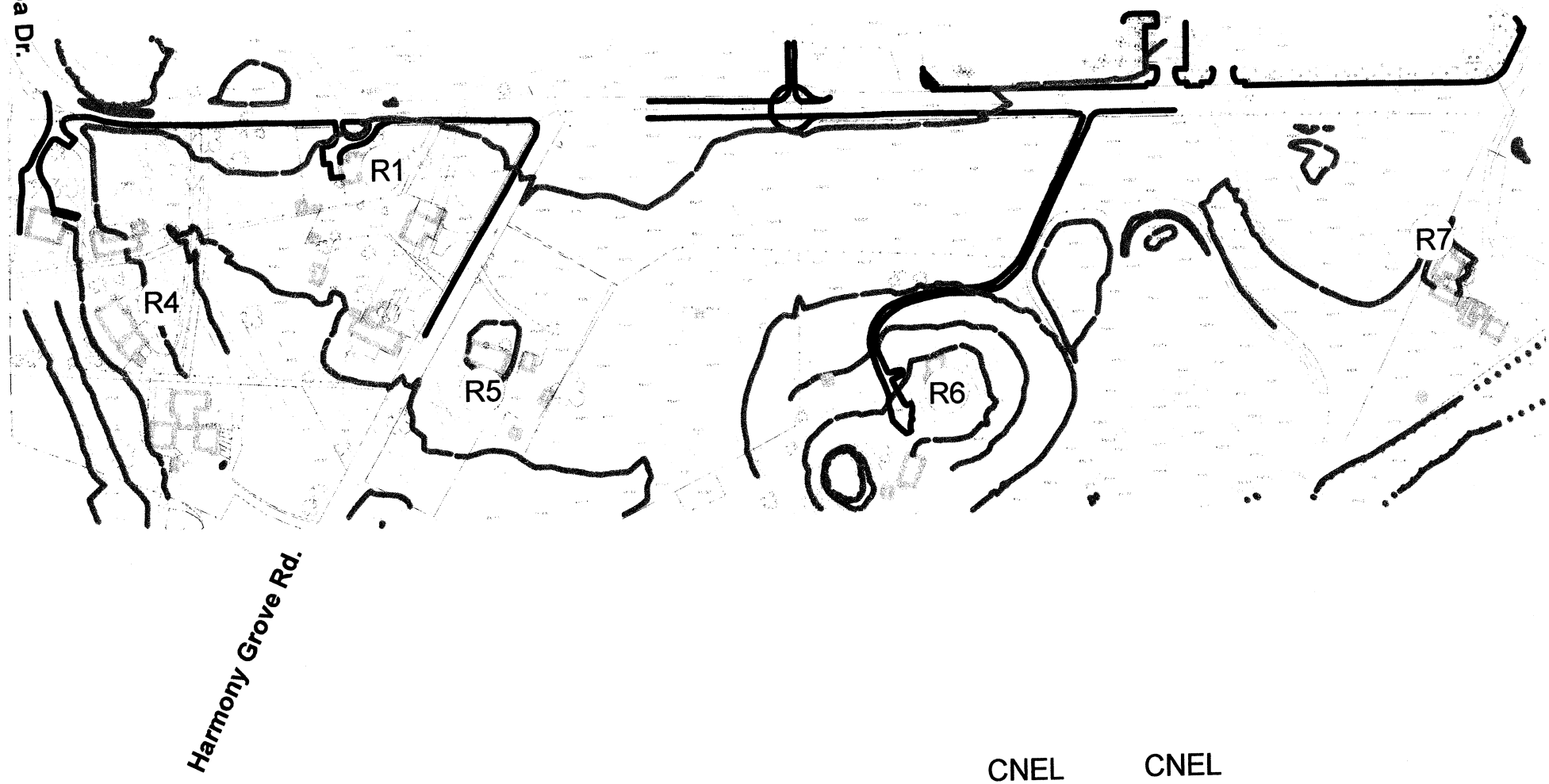
BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION

```
 1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1
 1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1
 1  1  1  1  1  1  1  1  1  1
```

CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION

```
6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 3. 6. 6. 6. 6. 6. 6. 6.
6. 6. 3. 3. 6. 6. 6. 6. 6. 6. 6. 3. 0. 0. 0. 0. 0. 6. 6. 6. 6. 6. 6. 6. 6.
6. 6. 6. 6. 6. 6. 6. 6. 6. 6.
```

OFF-SITE RESIDENCES ALONG HARMONY GROVE ROAD



SITE	CNEL EXISTING	CNEL FUTURE (CUMULATIVE)
R1	59	68
R4	51	57
R5	60	61
R6	54	59
R7	54	58

1" = 250'

```
Off-Site at HGR and KL (Existing) HGHGD.EX
T-Harmony Grove, 1
 232 , 40 , 15 , 40 , 8 , 40
T-Harmony Grove, 2
 232 , 40 , 15 , 40 , 8 , 40
T-Kauana Loa, 3
 59 , 40 , 4 , 40 , 2 , 40
T-Kauana Loa, 4
 59 , 40 , 4 , 40 , 2 , 40
T-Harmony Grove (E/O Kauana Loa, 5
 319 , 40 , 20 , 40 , 11 , 40
T-Harmony Grove (E/O Kauana Loa, 6
 319 , 40 , 20 , 40 , 11 , 40
L-Northbound, 1
N,5220.,4516,634,
N,5134.,4372,628,
N,4969.,4098,620,
N,4919.,4012,614,
N,4751.,3730,612,
N,4625.,3520,616,
N,4607.,3455,616,
N,4611.,3354,614,
L-Southbound, 2
N,5210.,4522,634,
N,5123.,4379,628,
N,4959.,4104,620,
N,4909.,4018,614,
N,4740.,3736,612,
N,4613.,3525,616,
N,4595.,3456,616,
4599.,3354,614,
L-Lane 1, 3
N,4561.,4538,634,
N,4864.,4536,632,
N,5060.,4535,632,
L-Lane 2, 4
N,4561.,4561,634,
N,4864.,4548,632,
N,5060.,4547,632,
L-Lane 1, 5
N,5060.,4535,632,
N,5984.,4527,630,
N,6764.,4519,623,
L-Lane 2, 6
N,5060.,4547,632,
N,5984.,4539,630,
N,6764.,4537,623,
B-House, 1 , 2 , 0 ,0
4555.,3786,639,647,
4592.,3777,639,647,
4605.,3846,639,647,
4549.,3857,639,647,
B-House, 2 , 2 , 0 ,0
4578.,4041,631,639,
4607.,4040,631,639,
4608.,4069,631,639,
4629.,4068,631,639,
4630.,4094,631,639,
4569.,4098,631,639,
```

```
B-House, 3 , 2 , 0 ,0
4861.,4430,627,635,
4855.,4465,627,635,
4911.,4476,627,635,
4914.,4447,627,635,
B-House, 4 , 2 , 0 ,0
5065.,4140,630,638,
5076.,4168,630,638,
5137.,4147,630,638,
5123.,4114,630,638,
B-House, 5 , 2 , 0 ,0
5845.,4087,653,661,
5841.,4122,653,661,
5867.,4125,653,661,
5870.,4090,653,661,
R, 1 , 67 ,500
4954,4419,631.,R1
R, 2 , 67 ,500
4540,4235,635.,R4
R, 3 , 67 ,500
5081,4083,634.,R5
R, 4 , 67 ,500
5857,4077,661.,R6
R, 5 , 67 ,500
6711,4283,625.,R7
R, 6 , 67 ,500
4911,4477,633.,
R, 7 , 67 ,500
5071,4156,635.,
D, 4.5
ALL,1,2,3,5
C,C
```

15	-	8.*	B5 P1	35.2	MASONRY
16	-	8.*	B5 P2	26.2	MASONRY
17	-	8.*	B5 P3	35.1	MASONRY

0 1 2 3 4 5 6 7

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	R1	67.	500.	59.2
2	R4	67.	500.	50.9
3	R5	67.	500.	59.7
4	R6	67.	500.	54.3
5	R7	67.	500.	53.8
6	R-6	67.	500.	62.4
7	R-7	67.	500.	65.2

BARRIER TYPE	COST
BERM	0.
MASONRY	47483.
MASONRY/JERSEY	0.
CONCRETE	0.
TOTAL COST = $	47000.

BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8.

```
Off-Site at HGR and KL (Near-Term Cumulative  HGHGD.NT)
T-Harmony Grove, 1
 705 , 40 , 44 , 40 , 25 , 40
T-Harmony Grove, 2
 705 , 40 , 44 , 40 , 25 , 40
T-Kauana Loa, 3
 97 , 40 , 6 , 40 , 3 , 40
T-Kauana Loa, 4
 97 , 40 , 6 , 40 , 3 , 40
T-Harmony Grove (E/O Kauana Loa, 5
 769 , 40 , 48 , 40 , 27 , 40
T-Harmony Grove Road(E/O Kauana, 6
 769 , 40 , 48 , 40 , 27 , 40
L-Northbound, 1
N,5072.,4544,632,
N,5028.,4371,626,
N,4952.,4210,624,
N,4837.,4019,614,
N,4722.,3828,614,
N,4626.,3600,612,
N,4596.,3354,613,
L-Southbound, 2
N,5048.,4548,632,
N,5006.,4379,626,
N,4931.,4223,624,
N,4817.,4031,614,
N,4702.,3840,614,
N,4603.,3606,612,
N,4572.,3353,613,
L-Lane 1, 3
N,4561.,4538,634,
N,4864.,4536,632,
N,5060.,4535,632,
L-Lane 2, 4
N,4561.,4561,634,
N,4864.,4548,632,
N,5060.,4547,632,
L-Lane 1, 5
N,5060.,4535,632,
N,5984.,4527,630,
N,6764.,4519,623,
L-Lane 2, 6
N,5060.,4547,632,
N,5984.,4539,630,
N,6764.,4537,623,
B-House, 1 , 2 , 0 ,0
4861.,4430,637,645,
4855.,4465,637,645,
4911.,4476,637,645,
4914.,4447,637,645,
B-House, 2 , 2 , 0 ,0
5065.,4140,630,638,
5076.,4168,630,638,
5137.,4147,630,638,
5123.,4114,630,638,
B-House, 3 , 2 , 0 ,0
5845.,4087,653,661,
5841.,4122,653,661,
5867.,4125,653,661,
```

```
5870.,4090,653,661,
R, 1 , 67 ,500
4954,4419,631.,R1
R, 2 , 67 ,500
4540,4235,635.,R4
R, 3 , 67 ,500
5081,4083,634.,R5
R, 4 , 67 ,500
5867,4077,661.,R6
R, 5 , 67 ,500
6711,4283,625.,R7
R, 6 , 67 ,500
4911,4477,633.,
R, 7 , 67 ,500
5071,4156,635.,
D, 4.5
ALL,1,2,3,5
C,C
```

SOUND32 - RELEASE 07/30/91

TITLE:
Off-Site at HGR and KL (Near-Term Cumulative HGHGD.NT)

EFFECTIVENESS / COST RATIOS
****

BAR ELE	0	1	2	3	4	5	6	7	
1	-	0.*							B1 P1
2	-	0.*							B1 P2
3	-	0.*							B1 P3
4	-	0.*							B2 P1
5	-	0.*							B2 P2
6	-	0.*							B2 P3
7	-	0.*							B3 P1
8	-	0.*							B3 P2
9	-	0.*							B3 P3
	0	1	2	3	4	5	6	7	

1

BARRIER DATA
****

BAR ELE	0	BARRIER HEIGHTS 1	2	3	4	5	6	7	BAR ID	LENGTH	TYPE
1	-	8.*							B1 P1	35.5	MASONRY
2	-	8.*							B1 P2	57.1	MASONRY
3	-	8.*							B1 P3	29.2	MASONRY
4	-	8.*							B2 P1	30.1	MASONRY
5	-	8.*							B2 P2	64.5	MASONRY
6	-	8.*							B2 P3	35.8	MASONRY
7	-	8.*							B3 P1	35.2	MASONRY
8	-	8.*							B3 P2	26.2	MASONRY
9	-	8.*							B3 P3	35.1	MASONRY
	0	1	2	3	4	5	6	7			

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	R1	67.	500.	68.4
2	R4	67.	500.	57.1
3	R5	67.	500.	61.1
4	R6	67.	500.	58.9
5	R7	67.	500.	57.7
6	R-6	67.	500.	67.5
7	R-7	67.	500.	66.1

BARRIER TYPE	COST

```
Off-Site at HGR and KL (Near-Term Cumulative) -- Mitigated HGHGD.MIT
T-Harmony Grove, 1
 705 , 40 , 44 , 40 , 25 , 40
T-Harmony Grove, 2
 705 , 40 , 44 , 40 , 25 , 40
T-Kauana Loa, 3
 97 , 40 , 6 , 40 , 3 , 40
T-Kauana Loa, 4
 97 , 40 , 6 , 40 , 3 , 40
T-Harmony Grove (E/O Kauana Loa, 5
 769 , 40 , 48 , 40 , 27 , 40
T-Harmony Grove Road (E/O Kauan, 6
 769 , 40 , 48 , 40 , 27 , 40
L-Northbound, 1
N,5072.,4544,632,
N,5028.,4371,626,
N,4952.,4210,624,
N,4837.,4019,614,
N,4722.,3828,614,
N,4626.,3600,612,
N,4596.,3354,613,
L-Southbound, 2
N,5048.,4548,632,
N,5006.,4379,626,
N,4931.,4223,624,
N,4817.,4031,614,
N,4702.,3840,614,
N,4603.,3606,612,
N,4572.,3353,613,
L-Lane 1, 3
N,4561.,4538,634,
N,4864.,4536,632,
N,5060.,4535,632,
L-Lane 2, 4
N,4561.,4561,634,
N,4864.,4548,632,
N,5060.,4547,632,
L-Lane 1, 5
N,5060.,4535,632,
N,5984.,4527,630,
N,6764.,4519,623,
L-Lane 2, 6
N,5060.,4547,632,
N,5984.,4539,630,
N,6764.,4537,623,
B-House, 1 , 2 , 0 ,0
4861.,4430,637,645,
4855.,4465,637,645,
4911.,4476,637,645,
4914.,4447,637,645,
B-House, 2 , 2 , 0 ,0
5065.,4140,630,638,
5076.,4168,630,638,
5137.,4147,630,638,
5123.,4114,630,638,
B-Proposed Wall, 3 , 2 , 0 ,0
5006.,4506,626,634,M1
4960.,4410,626,634,M2
4822.,4390,626,634,M3
```

```
B-House, 4 , 2 , 0 ,0
5845.,4087,653,661,
5841.,4122,653,661,
5867.,4125,653,661,
5870.,4090,653,661,
R, 1 , 67 ,500
4954,4419,631.,R1
R, 2 , 67 ,500
4540,4235,635.,R4
R, 3 , 67 ,500
5081,4083,634.,R5
R, 4 , 67 ,500
5857,4077,661.,R6
R, 5 , 67 ,500
6711,4283,625.,R7
R, 6 , 67 ,500
4911,4477,633.,
R, 7 , 67 ,500
5071,4156,635.,
D, 4.5
ALL,1,2,3,5
C,C
```

SOUND32 - RELEASE 07/30/91

TITLE:
Off-Site at HGR and KL (Near-Term Cumulative) -- Mitigated HGHGD.MIT

EFFECTIVENESS / COST RATIOS
****

BAR ELE	0	1	2	3	4	5	6	7	
1	-	0.*							B1 P1
2	-	0.*							B1 P2
3	-	0.*							B1 P3
4	-	0.*							B2 P1
5	-	0.*							B2 P2
6	-	0.*							B2 P3
7	-	0.*							M1
8	-	0.*							M2
9	-	0.*							B4 P1
10	-	0.*							B4 P2
11	-	0.*							B4 P3
	0	1	2	3	4	5	6	7	

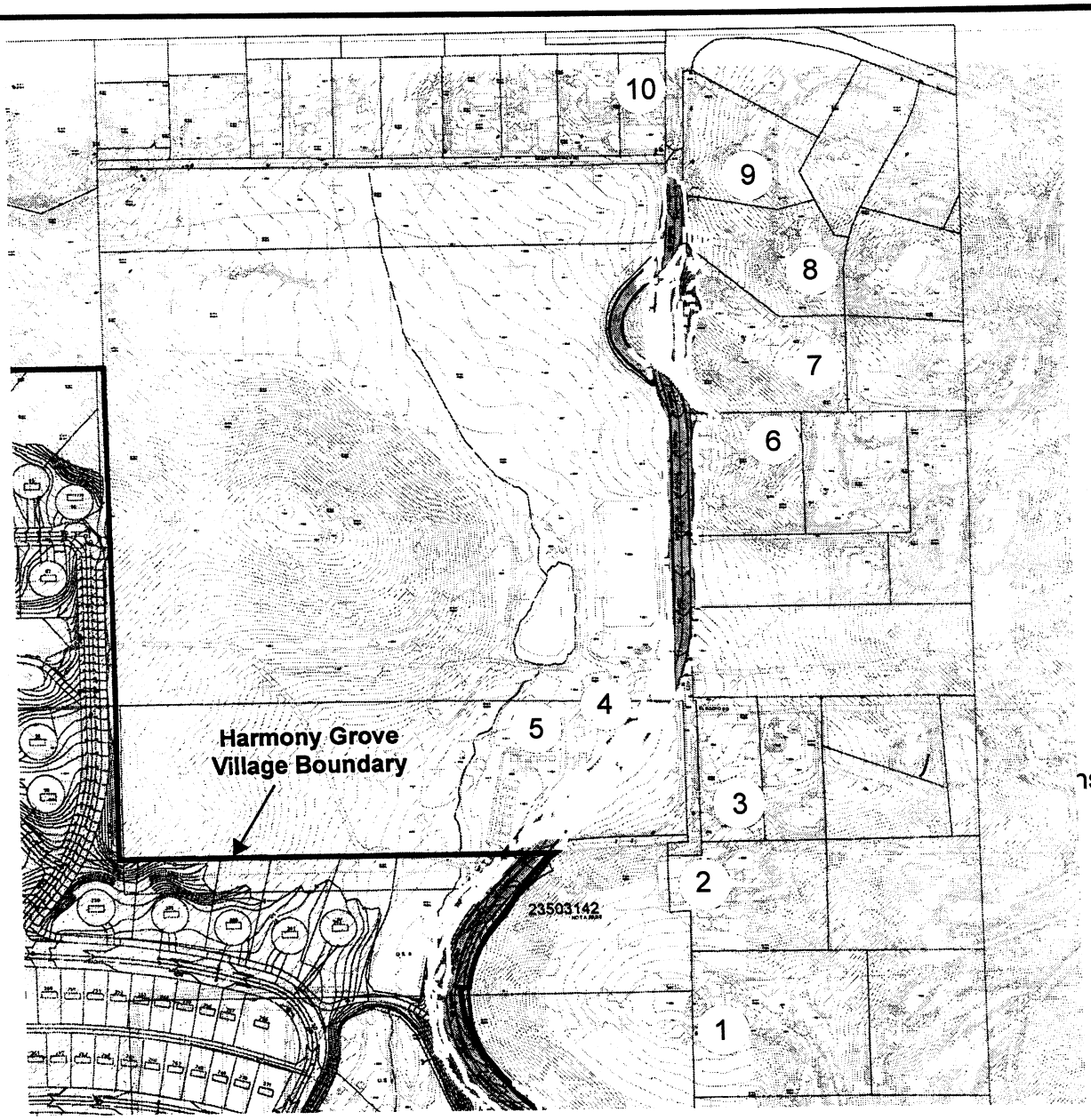
1

BARRIER DATA
****

BAR ELE	0	1	2	3	4	5	6	7	BAR ID	LENGTH	TYPE
1	-	8.*							B1 P1	35.5	MASONRY
2	-	8.*							B1 P2	57.1	MASONRY
3	-	8.*							B1 P3	29.2	MASONRY
4	-	8.*							B2 P1	30.1	MASONRY
5	-	8.*							B2 P2	64.5	MASONRY
6	-	8.*							B2 P3	35.8	MASONRY
7	-	8.*							M1	106.5	MASONRY
8	-	8.*							M2	139.4	MASONRY
9	-	8.*							B4 P1	35.2	MASONRY
10	-	8.*							B4 P2	26.2	MASONRY
11	-	8.*							B4 P3	35.1	MASONRY
	0	1	2	3	4	5	6	7			

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	R1	67.	500.	61.4
2	R4	67.	500.	57.0
3	R5	67.	500.	61.1
4	R6	67.	500.	58.1
5	R7	67.	500.	57.7



Off-Site Country Club Drive CNEL Noise Level

Receptor	Existing	Existing Plus Project	Near Term Cumulative
1	51	55	56
2	54	58	59
3	55	59	60
4	52	56	57
5	48	52	53
6	53	57	58
7	51	55	56
8	51	55	56
9	55	59	60
10	55	59	60

0 FEET 400

Base Map Source: Rick Engineering, May 2006

Receptor sites are at the closest location of the house or backyard to Country Club Drive

Pacific Noise Control

Off Site Noise Receptor Locations Adjacent to Country Club Drive

Harmony Grove Village --Existing Harmony Grove Offsite CCD-- (HGCCD.EX)
T-Country Club Drive (n/o V. Rd, 1
 69 , 30 , 4 , 30 , 2 , 30
T-Country Club Drive (n/o V. Rd, 2
 69 , 30 , 4 , 30 , 2 , 30
T-Country Club, 3
 69 , 30 , 4 , 30 , 2 , 30
T-Country Club Drive, 4
 69 , 40 , 4 , 40 , 2 , 40
T-Country Club, 5
 69 , 30 , 4 , 30 , 2 , 30
T-Country Club, 6
 69 , 30 , 4 , 30 , 2 , 30
T-Country Club, 7
 69 , 30 , 4 , 30 , 2 , 30
T-Country Club, 8
 69 , 40 , 4 , 40 , 2 , 40
L-Northbound, 1
N,6292962.,1982848,635,
N,6292964.,1983392,642,
N,6292934.,1983452,642,
N,6292869.,1983481,640,
N,6292662.,1983563,632,
N,6292538.,1983670,628,
N,6292445.,1983809,622,
N,6292445.,1983925,622,
N,6292497.,1984050,625,
L-Northbound, 2
N,6292497.,1984050,625,
N,6292596.,1984175,629,
N,6292735.,1984220,639,
N,6292912.,1984233,648,
N,6292972.,1984286,645,
N,6292981.,1984352,640,
N,6292986.,1984741,636,
N,6292991.,1985174,645,
N,6292959.,1985300,644,
L-Northbound, 3
N,6292959.,1985300,644,
N,6292871.,1985389,645,
N,6292854.,1985486,646,
N,6292910.,1985556,654,
N,6292970.,1985629,660,
N,6292991.,1985668,660,
L-Northbound, 4
N,6292991.,1985668,660,
N,6293003.,1985872,667,
N,6293026.,1986054,674,
N,6293030.,1986140,680,
L-Southbound, 5
N,6292950.,1982847,635,
N,6292952.,1983389,642,
N,6292924.,1983442,642,
N,6292864.,1983470,640,
N,6292656.,1983552,632,
N,6292529.,1983662,628,
N,6292433.,1983805,622,
N,6292433.,1983927,622,
N,6292487.,1984056,625,

```
N,6292589.,1984184,629,
L-Southbound, 6
N,6292589.,1984184,629,
N,6292732.,1984231,639,
N,6292907.,1984244,648,
N,6292961.,1984292,645,
N,6292969.,1984353,640,
N,6292974.,1984740,636,
N,6292979.,1985172,645,
N,6292948.,1985294,644,
N,6292861.,1985382,645,
L-Southbound, 7
N,6292861.,1985382,645,
N,6292843.,1985486,646,
N,6292900.,1985563,654,
N,6292961.,1985636,660,
N,6292979.,1985668,660,
L-Southbound, 8
N,6292979.,1985668,660,
N,6292991.,1985872,667,
N,6293014.,1986054,674,
N,6293018.,1986140,680,
R, 1 , 67 ,500
6292994,1983788,751.,1/1
R, 2 , 67 ,500
6293042,1984302,650.,2/3
R, 3 , 67 ,500
6293179,1985190,688.,3/6
R, 4 , 67 ,500
6293283,1985335,713.,4/7
R, 5 , 67 ,500
6293284,1985556,734.,5/8
R, 6 , 67 ,500
6292666,1984528,625.,6/5
R, 7 , 67 ,500
6292966,1984180,667.,7/2
R, 8 , 67 ,500
6293137,1985799,701.,8/9
R, 9 , 67 ,500
6292921,1986018,675.,9/10
R, 10 , 67 ,500
6292667,1984481,624.,6b/-
R, 11 , 67 ,500
6292829,1984502,632.,6c/4
D, 4.5
ALL,2,6,7,9,10,11
C,C
```

SOUND32 - RELEASE 07/30/91

TITLE:
Harmony Grove Village --Existing Harmony Grove Offsite CCD-- (HGCCD.EX)

BASED ON FHWA-RD-108 AND
CALIFORNIA REFERENCE ENERGY MEAN EMISSION LEVELS

RECEIVER	LEQ
1/1	50.9
2/3	55.1
3/6	52.6
4/7	50.5
5/8	50.6
6/5	47.5
7/2	53.9
8/9	55.0
9/10	55.0
6b/-	48.1
6c/4	51.5

Existing ADT = 1,500

Existing + Project = 3540 (Options A+C) +3.7 dB
= 4,040 (Option B) +4.3 dB

Existing + Project + Cumulative = 4,370 (Options A+C) +4.6 dB
= 4,870 (Option B) +5.1 dB

```
Harmony Grove Village--Fut (E+P+C) C C Dr. Offsite 30 MPH-- (HGCCD30.MIT)
T-Country Club Drive, 1
 222 , 30 , 14 , 30 , 8 , 30
T-Country Club Drive, 2
 222 , 30 , 14 , 30 , 8 , 30
T-Country Club Drive, 3
 222 , 40 , 14 , 40 , 8 , 40
T-Country Club Drive, 4
 222 , 30 , 14 , 30 , 8 , 30
T-Country Club Drive, 5
 222 , 30 , 14 , 30 , 8 , 30
T-Country Club Drive, 6
 222 , 40 , 14 , 40 , 8 , 40
L-Northbound, 1
N,6292963.,1982476,647,
N,6292954.,1982658,640,
N,6292955.,1982854,636,
N,6292955.,1982866,636,1
N,6292955.,1983017,634,2
N,6292947.,1983176,634,3
N,6292877.,1983356,636,4
N,6292709.,1983510,634,5
N,6292517.,1983649,628,6
N,6292471.,1983698,626,7
L-Northbound, 2
N,6292471.,1983698,626,7
N,6292423.,1983841,622,8
N,6292470.,1984024,624,9
N,6292598.,1984178,632,10
N,6292787.,1984380,630,11
N,6292935.,1984565,632,12
N,6292970.,1984655,634,13
N,6292987.,1984845,638,14
N,6292991.,1985122,644,15
N,6292990.,1985212,646,16
N,6292959.,1985391,652,17
N,6292966.,1985525,659,18
N,6292981.,1985628,661,19
L-Northbound, 3
N,6292981.,1985628,661,
N,6293003.,1985872,667,
N,6293026.,1986054,674,
N,6293030.,1986140,680,
L-Southbound, 4
N,6292951.,1982474,647,
N,6292942.,1982658,640,
N,6292943.,1982854,636,
N,6292943.,1982866,636,1
N,6292943.,1983016,634,2
N,6292935.,1983173,634,3
N,6292867.,1983349,636,4
N,6292701.,1983501,634,5
N,6292509.,1983640,628,6
N,6292461.,1983691,626,7
N,6292411.,1983841,622,8
L-Southbound, 5
N,6292411.,1983841,622,8
N,6292460.,1984030,624,9
N,6292589.,1984185,632,10
```

```
N,6292777.,1984388,630,11
N,6292924.,1984571,632,12
N,6292958.,1984658,634,13
N,6292975.,1984845,638,14
N,6292979.,1985122,644,15
N,6292978.,1985210,646,16
N,6292947.,1985390,652,17
N,6292954.,1985526,659,18
N,6292969.,1985630,661,19
L-Southbound, 6
N,6292969.,1985630,661,19
N,6292991.,1985872,667,
N,6293014.,1986054,674,
N,6293018.,1986140,680,
B-New Slope, 1 , 2 , 0 ,0
6293022.4,1985267,654,654,
6293026.7,1985312,660,660,
6293033.2,1985395,670,670,
6293050.3,1985425,680,680,
6293067.6,1985466,690,690,
6293068.3,1985515,690,690,
6293048.5,1985546,680,680,
6293051.6,1985571,670,670,
B-Wall, 2 , 2 , 0 ,0
6292912.,1984577,632,638,B1
6292768.,1984400,630,636,B2
R, 1 , 67 ,500
6292994,1983788,751.,1/1
R, 2 , 67 ,500
6293042,1984302,650.,2/3
R, 3 , 67 ,500
6293179,1985190,688.,3/6
R, 4 , 67 ,500
6293283,1985335,713.,4/7
R, 5 , 67 ,500
6293284,1985556,734.,5/8
R, 6 , 67 ,500
6292666,1984528,625.,6/5
R, 7 , 67 ,500
6292966,1984180,667.,7/2
R, 8 , 67 ,500
6293137,1985799,701.,8/9
R, 9 , 67 ,500
6292921,1986018,675.,9/10
R, 10 , 67 ,500
6292667,1984481,624.,6b/-
R, 11 , 67 ,500
6292829,1984502,632.,6c/4
D, 4.5
ALL,2,6,7,9,10,11
C,C
```

SOUND32 - RELEASE 07/30/91

TITLE:
Harmony Grove Village--Fut (E+P+C) C C Dr. Offsite 30 MPH-- (HGCCD30.MIT)

EFFECTIVENESS / COST RATIOS
****

BAR ELE	0	1	2	3	4	5	6	7	
1	-	0.*							B1 P1
2	-	0.*							B1 P2
3	-	0.*							B1 P3
4	-	0.*							B1 P4
5	-	0.*							B1 P5
6	-	0.*							B1 P6
7	-	0.*							B1 P7
8	-	0.*							B1
	0	1	2	3	4	5	6	7	

1

BARRIER DATA
****

BAR ELE	0	1	2	3	4	5	6	7	BAR ID	LENGTH	TYPE
1	-	0.*							B1 P1	45.6	MASONRY
2	-	0.*							B1 P2	83.9	MASONRY
3	-	0.*							B1 P3	36.1	MASONRY
4	-	0.*							B1 P4	45.5	MASONRY
5	-	0.*							B1 P5	49.0	MASONRY
6	-	0.*							B1 P6	38.2	MASONRY
7	-	0.*							B1 P7	27.1	MASONRY
8	-	6.*							B1	228.2	MASONRY
	0	1	2	3	4	5	6	7			

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	1/1	67.	500.	55.5
2	2/3	67.	500.	52.7
3	3/6	67.	500.	57.5
4	4/7	67.	500.	54.8
5	5/8	67.	500.	55.5
6	6/5	67.	500.	54.3
7	7/2	67.	500.	52.4
8	8/9	67.	500.	60.4
9	9/10	67.	500.	60.4
10	6b/-	67.	500.	55.5
11	6c/4	67.	500.	58.6

BARRIER TYPE	COST

```
Harmony Grove Village--Future (E+P+C) C C Dr. Offsite 35 MPH-- (HGCCD35.MIT
T-Country Club Drive, 1
 222 , 35 , 14 , 35 , 8 , 35
T-Country Club Drive, 2
 222 , 35 , 14 , 35 , 8 , 35
T-Country Club Drive, 3
 222 , 40 , 14 , 40 , 8 , 40
T-Country Club Drive, 4
 222 , 35 , 14 , 35 , 8 , 35
T-Country Club Drive, 5
 222 , 35 , 14 , 35 , 8 , 35
T-Country Club Drive, 6
 222 , 40 , 14 , 40 , 8 , 40
L-Northbound, 1
N,6292963.,1982476,647,
N,6292954.,1982658,640,
N,6292955.,1982854,636,
N,6292955.,1982866,636,1
N,6292953.,1982980,633,2
N,6292926.,1983121,633,3
N,6292799.,1983341,636,4
N,6292664.,1983475,636,5
N,6292510.,1983626,628,6
N,6292467.,1983684,626,7
N,6292407.,1983863,624,8
L-Northbound, 2
N,6292407.,1983863,624,8
N,6292423.,1984006,626,9
N,6292509.,1984159,628,10
N,6292791.,1984371,630,11
N,6292930.,1984562,632,12
N,6292963.,1984652,634,13
N,6292988.,1984866,636,14
N,6292991.,1985122,644,15
N,6292989.,1985216,646,16
N,6292961.,1985398,652,17
N,6292966.,1985525,658,18
N,6292981.,1985628,661,19
L-Northbound, 3
N,6292981.,1985628,661,19
N,6293003.,1985872,667,
N,6293026.,1986054,674,
N,6293030.,1986140,680,
L-Southbound, 4
N,6292951.,1982474,647,
N,6292942.,1982658,640,
N,6292943.,1982854,636,
N,6292943.,1982866,636,1
N,6292941.,1982978,633,2
N,6292914.,1983116,633,3
N,6292790.,1983333,636,4
N,6292656.,1983466,636,5
N,6292501.,1983618,628,6
N,6292456.,1983678,626,7
N,6292395.,1983862,624,8
L-Southbound, 5
N,6292395.,1983862,624,8
N,6292411.,1984010,626,9
N,6292500.,1984167,628,10
```

```
N,6292783.,1984380,630,11
N,6292920.,1984568,632,12
N,6292951.,1984655,634,13
N,6292976.,1984867,636,14
N,6292979.,1985122,644,15
N,6292977.,1985215,646,16
N,6292949.,1985397,652,17
N,6292954.,1985526,658,18
N,6292969.,1985630,661,19
L-Southbound, 6
N,6292969.,1985630,661,19
N,6292991.,1985872,667,
N,6293014.,1986054,674,
N,6293018.,1986140,680,
B-New Slope, 1 , 2 , 0 ,0
6293022.4,1985267,654,654,
6293026.7,1985312,660,660,
6293033.2,1985395,670,670,
6293050.3,1985425,680,680,
6293067.6,1985466,690,690,
6293068.3,1985515,690,690,
6293048.5,1985546,680,680,
6293051.6,1985571,670,670,
B-Wall, 2 , 2 , 0 ,0
6292906.,1984572,632,638,B1
6292775.,1984392,630,636,B2
R, 1 , 67 ,500
6292994,1983788,751.,1/1
R, 2 , 67 ,500
6293042,1984302,650.,2/3
R, 3 , 67 ,500
6293179,1985190,688.,3/6
R, 4 , 67 ,500
6293283,1985335,713.,4/7
R, 5 , 67 ,500
6293284,1985556,734.,5/8
R, 6 , 67 ,500
6292666,1984528,625.,6/5
R, 7 , 67 ,500
6292966,1984180,667.,7/2
R, 8 , 67 ,500
6293137,1985799,701.,8/9
R, 9 , 67 ,500
6292921,1986018,675.,9/10
R, 10 , 67 ,500
6292667,1984481,624.,6b/-
R, 11 , 67 ,500
6292829,1984502,632.,6c/4
D, 4.5
ALL,2,6,7,9,10,11
C,C
```

SOUND32 - RELEASE 07/30/91

TITLE:
Harmony Grove Village--Future (E+P+C) C C Dr. Offsite 35 MPH-- (HGCCD35.MIT

EFFECTIVENESS / COST RATIOS
****

BAR ELE	0	1	2	3	4	5	6	7	
1	-	0.*							B1 P1
2	-	0.*							B1 P2
3	-	0.*							B1 P3
4	-	0.*							B1 P4
5	-	0.*							B1 P5
6	-	0.*							B1 P6
7	-	0.*							B1 P7
8	-	0.*							B1
	0	1	2	3	4	5	6	7	

1

BARRIER DATA
****

BAR ELE	BARRIER HEIGHTS 0	1	2	3	4	5	6	7	BAR ID	LENGTH	TYPE
1	-	0.*							B1 P1	45.6	MASONRY
2	-	0.*							B1 P2	83.9	MASONRY
3	-	0.*							B1 P3	36.1	MASONRY
4	-	0.*							B1 P4	45.5	MASONRY
5	-	0.*							B1 P5	49.0	MASONRY
6	-	0.*							B1 P6	38.2	MASONRY
7	-	0.*							B1 P7	27.1	MASONRY
8	-	6.*							B1	222.6	MASONRY
	0	1	2	3	4	5	6	7			

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	1/1	67.	500.	55.5
2	2/3	67.	500.	53.1
3	3/6	67.	500.	57.9
4	4/7	67.	500.	55.1
5	5/8	67.	500.	55.6
6	6/5	67.	500.	54.6
7	7/2	67.	500.	52.7
8	8/9	67.	500.	60.4
9	9/10	67.	500.	60.5
10	6b/-	67.	500.	55.9
11	6c/4	67.	500.	58.7

BARRIER TYPE	COST

```
Harmony Grove Village--Future (E+P+C)C C Dr. Offsite 40 MPH-- (HGCCD40.MIT).
T-Country Club Drive, 1
 222 , 40 , 14 , 40 , 8 , 40
T-Country Club Drive, 2
 222 , 40 , 14 , 40 , 8 , 40
T-Country Club Drive, 3
 222 , 40 , 14 , 40 , 8 , 40
T-Country Club Drive, 4
 222 , 40 , 14 , 40 , 8 , 40
T-Country Club Drive, 5
 222 , 40 , 14 , 40 , 8 , 40
T-Country Club Drive, 6
 222 , 40 , 14 , 40 , 8 , 40
L-Northbound, 1
N,6292963.,1982476,647,
N,6292954.,1982658,640,
N,6292955.,1982854,636,
N,6292946.,1982875,634,1
N,6292929.,1982975,630,2
N,6292877.,1983095,626,3
N,6292709.,1983309,626,4
N,6292638.,1983394,628,5
N,6292489.,1983576,628,6
N,6292424.,1983710,626,7
N,6292401.,1983856,624,8
L-Northbound, 2
N,6292401.,1983856,624,8
N,6292427.,1984013,624,9
N,6292520.,1984178,624,10
N,6292792.,1984464,628,11
N,6292904.,1984607,630,12
N,6292950.,1984720,632,13
N,6292965.,1984819,634,14
N,6292975.,1985001,640,15
N,6292985.,1985209,650,16
N,6292993.,1985374,658,17
N,6293001.,1985536,664,18
N,6293005.,1985630,666,19
L-Northbound, 3
N,6293005.,1985636,660,19
N,6293003.,1985872,667,
N,6293026.,1986054,674,
N,6293030.,1986140,680,
L-Southbound, 4
N,6292951.,1982474,647,
N,6292942.,1982658,640,
N,6292943.,1982854,636,
N,6292934.,1982873,634,1
N,6292917.,1982972,630,2
N,6292866.,1983089,626,3
N,6292700.,1983301,626,4
N,6292628.,1983387,628,5
N,6292479.,1983569,628,6
N,6292412.,1983706,626,7
N,6292389.,1983856,624,8
L-Southbound, 5
N,6292389.,1983856,624,8
N,6292415.,1984017,624,9
N,6292510.,1984185,624,10
```

```
N,6292783.,1984472,628,11
N,6292894.,1984613,630,12
N,6292938.,1984723,632,13
N,6292953.,1984820,634,14
N,6292963.,1985002,640,15
N,6292973.,1985209,650,16
N,6292981.,1985375,658,17
N,6292989.,1985537,664,18
N,6292993.,1985630,666,19
L-Southbound, 6
N,6292993.,1985630,660,19
N,6292991.,1985872,667,
N,6293014.,1986054,674,
N,6293018.,1986140,680,
B-New Slope, 1 , 2 , 0 ,0
6293022.4,1985267,654,654,
6293026.7,1985312,660,660,
6293033.2,1985395,670,670,
6293050.3,1985425,680,680,
6293067.6,1985466,690,690,
6293068.3,1985515,690,690,
6293048.5,1985546,680,680,
6293051.6,1985571,670,670,
B-Wall, 2 , 2 , 0 ,0
6292858.,1984591,628,634,B1
6292763.,1984480,628,634,B2
6292490.,1984195,624,630,B3
R, 1 , 67 ,500
6292994,1983788,751.,1/1
R, 2 , 67 ,500
6293042,1984302,650.,2/3
R, 3 , 67 ,500
6293179,1985190,688.,3/6
R, 4 , 67 ,500
6293283,1985335,713.,4/7
R, 5 , 67 ,500
6293284,1985556,734.,5/8
R, 6 , 67 ,500
6292666,1984528,625.,6/5
R, 7 , 67 ,500
6292966,1984180,667.,7/2
R, 8 , 67 ,500
6293137,1985799,701.,8/9
R, 9 , 67 ,500
6292921,1986018,675.,9/10
R, 10 , 67 ,500
6292667,1984481,624.,6b/-
R, 11 , 67 ,500
6292829,1984502,632.,6c/4
D, 4.5
ALL,2,6,7,9,10,11
C,C
```

SOUND32 - RELEASE 07/30/91

TITLE:
Harmony Grove Village--Future (E+P+C)C C Dr. Offsite 40 MPH-- (HGCCD40.MIT)

EFFECTIVENESS / COST RATIOS

BAR ELE	0	1	2	3	4	5	6	7	
1	-	0.*							B1 P1
2	-	0.*							B1 P2
3	-	0.*							B1 P3
4	-	0.*							B1 P4
5	-	0.*							B1 P5
6	-	0.*							B1 P6
7	-	0.*							B1 P7
8	-	0.*							B1
9	-	0.*							B2
	0	1	2	3	4	5	6	7	

1

BARRIER DATA

BAR ELE	0	1	2	3	4	5	6	7	BAR ID	LENGTH	TYPE
1	-	0.*							B1 P1	45.6	MASONRY
2	-	0.*							B1 P2	83.9	MASONRY
3	-	0.*							B1 P3	36.1	MASONRY
4	-	0.*							B1 P4	45.5	MASONRY
5	-	0.*							B1 P5	49.0	MASONRY
6	-	0.*							B1 P6	38.2	MASONRY
7	-	0.*							B1 P7	27.1	MASONRY
8	-	6.*							B1	146.1	MASONRY
9	-	6.*							B2	394.7	MASONRY
	0	1	2	3	4	5	6	7			

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	1/1	67.	500.	56.0
2	2/3	67.	500.	52.9
3	3/6	67.	500.	58.9
4	4/7	67.	500.	56.1
5	5/8	67.	500.	56.5
6	6b/5	67.	500.	55.2
7	7/2	67.	500.	52.7
8	8/9	67.	500.	60.8
9	9/10	67.	500.	60.5
10	6b/-	67.	500.	55.7
11	6c/4	67.	500.	73.3

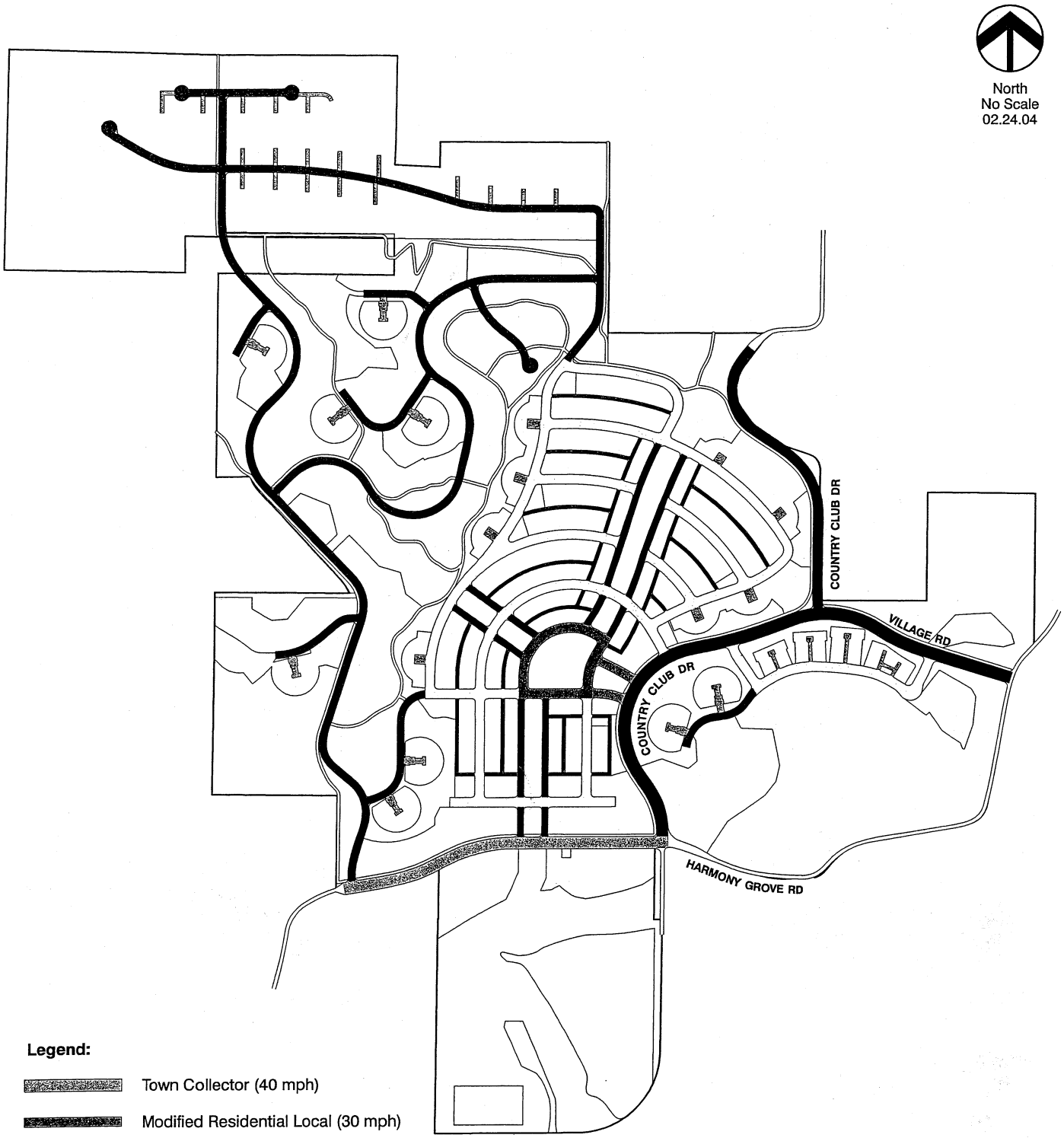
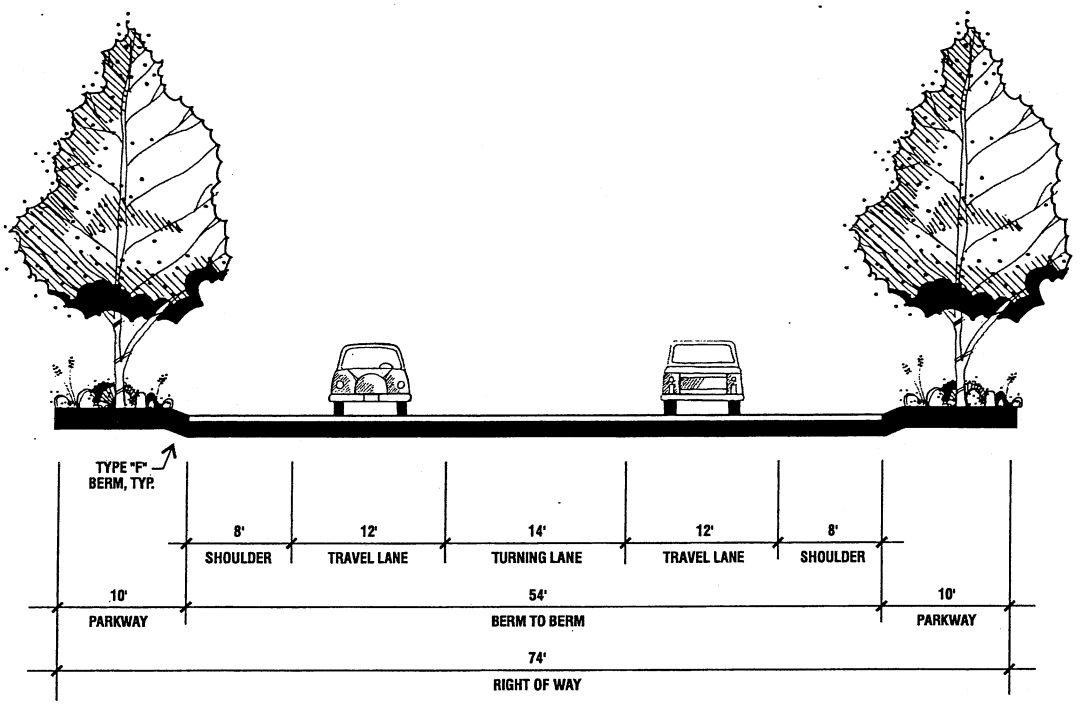


Figure 22

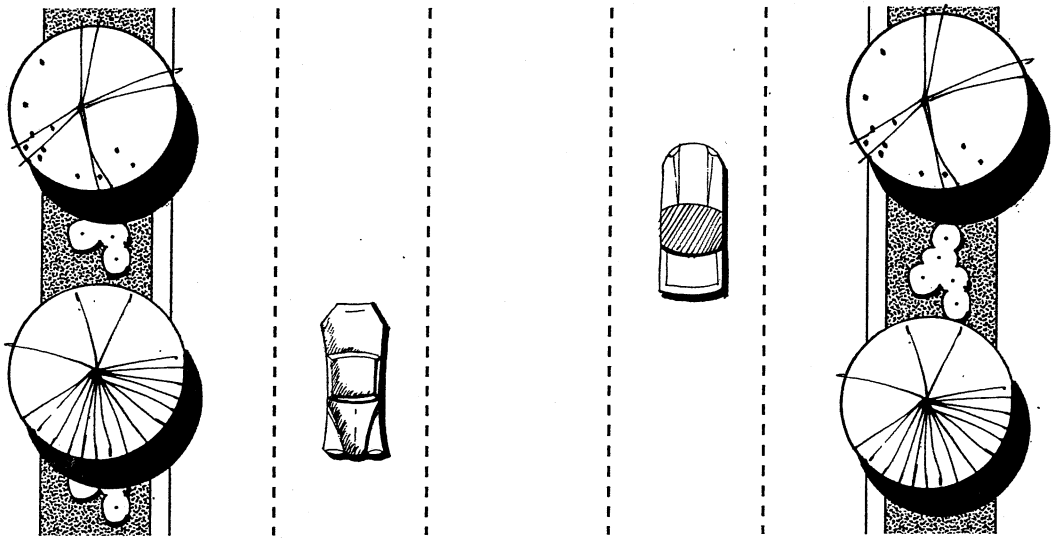
Proposed Circulation System

Harmony Grove Village

No Scale
12.09.03



Cross Section



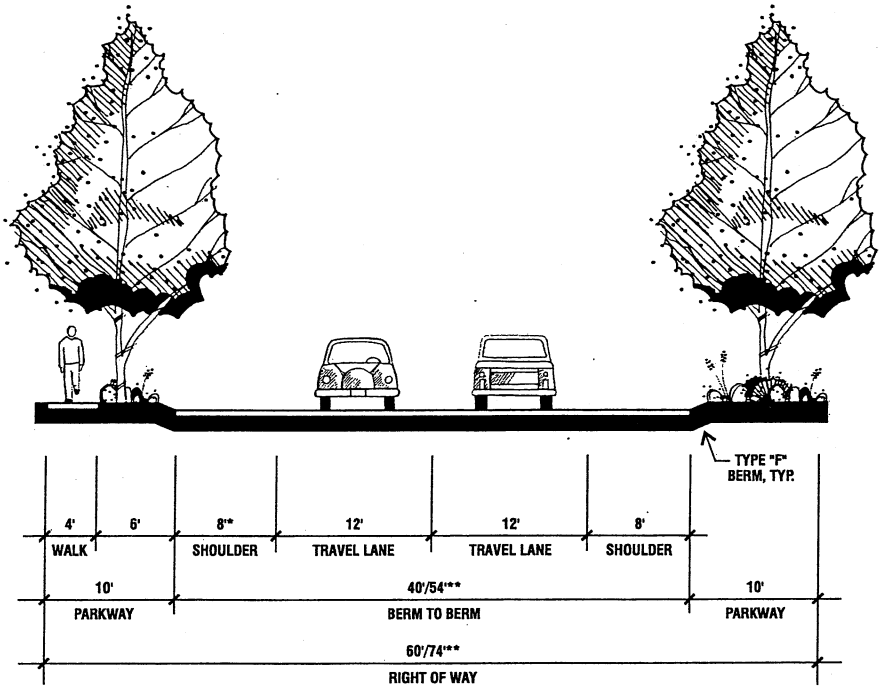
Plan View

Figure 23

Street Design
Town Collector (40 mph)

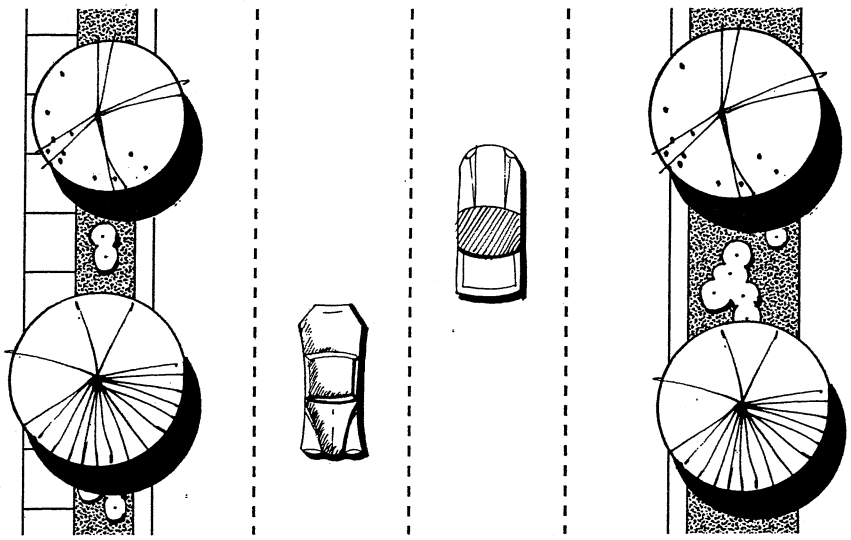
Harmony Grove Village

No Scale
12.09.03



* parking with 4' walk allowed at selected locations
** with 14' median turn lane

Cross Section



Plan View

Figure 25

Street Design
Modified Rural Light Collector (30 mph)

Harmony Grove Village

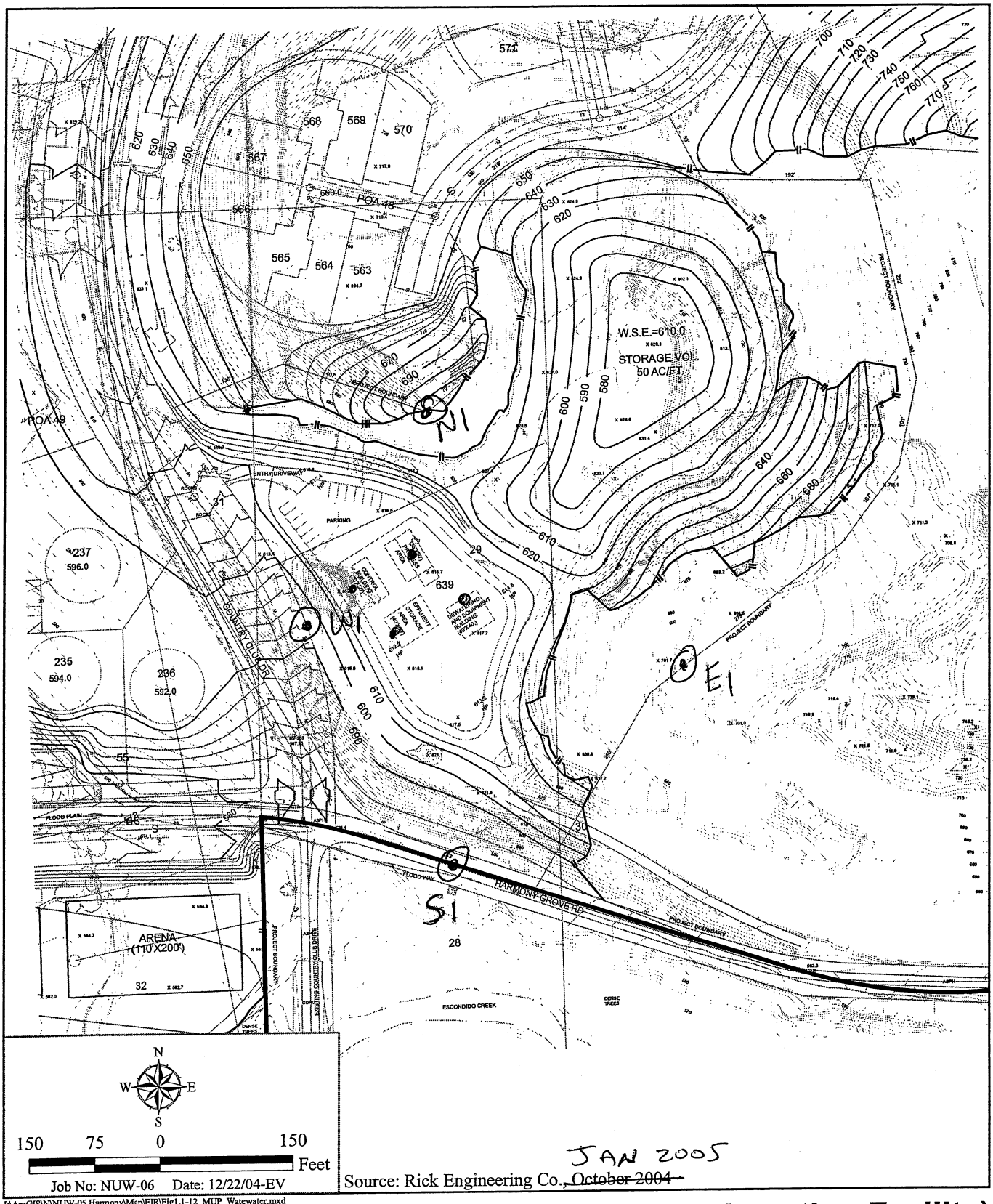
ATTACHMENT 3

WASTEWATER TREATMENT PLANT/PUMP STATION NOISE

Table A3.1

Wastewater Treatment Plant Preliminary Equipment and Noise Control Measures (Based on similar facility)

Facility Component	Primary Equipment	Manufacturer/Model	Power	Number of Units	Noise Control
Operations Building	Emergency Generator	Generac	350 kW	1	Building, sound absorbing material on walls, 12" acoustical louvers, muffler
	Air Compressor	Quincy	15 HP	2	Building
	Plant Sewer Pump	Pumpex	4 HP	4	in Vault
	Hydropneumatic Pump	Aurora 344ABF	10 HP	2	None
	Exhaust Fan	Harrington HPCA 3000	50 HP	2	Building, standard louvers
	Odor Control Room Exhaust Fan_	Lauren Cook 24ED604D17	3/4 HP	1	Building
Headworks, Effluent/Emergency Storage Area	Basin Pump	Pumpex K153CD5245	10 HP	4	in Vault
	Short-term Basin Pump	Barnes SE Series	½ HP	1	in Vault
	Auguer Monster	JWC Env. 2400 Series	2 HP	2	Building, standard louvers
	Blower	Kaeser Omega DB165	10 HP	1	Building, sound absorbing material on walls, standard louver
ProcessArea, Sludge/Dewatering Building	Exhaust Fan	Harrington HPIA 2225	2 HP	2	Building, sound absorbing material on walls
	Sludge Pump	Cornell 3NLTF53-4	3 HP	2	Building
	Treatment Plant Blower	Kaeser Omega 61	25 HP	3	Separate room in building, sound absorbing material on walls
	Centrifuge	Alfa Laval DS-401	75 HP	1	Building, sound absorbing material on walls
	Inclined Sludge Conveyor	American Bulk Conveying U-215	2 HP	1	Building, sound absorbing material on walls
	Horizontal Conveyor	American Bulk Conveying U-215	2 HP	1	Building, sound absorbing material on walls
	Backdrive Motor	Alfa Laval DS-401	15 HP	1	Building, sound absorbing material on walls
Effluent Pump Station	Effluent Pump	Paco 495-13	15 HP	2	Building, standard louvers
	Plant Water Pump	Pumpex K100F-CB5124	3 HP	1	Building, standard louvers
	Water Champ	USFilter SWC2F	2 HP	2	in Vault
	Irrigation Pump	Grundfos B45000055	5 HP	1	Metal enclosure
	Floco Mixer Pump	Sharpe Mixers 7.5N22-52_____	3/4 HP	2	None



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Plot Plan for MUP 04-013 (Wastewater Reclamation Facility)

HARMONY GROVE VILLAGE

HELIX

Receiver	Northern Property Boundary (N1)											
Equipment	Lp at 25' (dBA)	Receiver Elevation	Source Elevation (feet amsl)	Source to Receiver (feet)	Source to Barrier (feet)	Receiver to Barrier (feet)	Base of Barrier (feet amsl)	Barrier Height	Fresnel No. @ 500 Hz	Noise Abatement (dBA)	Lp(A) w/o Barrier (dBA)	Lp(A) (Mitigated) (dBA)
Control	77.1	715	618	217	0	217	0	0.0	Line of Sight	0	58	58
Process Area	55.5	715	618	172	0	172	0	0.0	Line of Sight	0	39	39
Dewatering/Equipment	50.0	715	618	223	0	223	0	0.0	Line of Sight	0	31	31
										Combined Sound Leve	58	58

Receiver	Southern Property Boundary (S1)											
Equipment	Lp at 25' (dBA)	Receiver Elevation	Source Elevation (feet amsl)	Source to Receiver (feet)	Source to Barrier (feet)	Receiver to Barrier (feet)	Base of Barrier (feet amsl)	Barrier Height	Fresnel No. @ 500 Hz	Noise Abatement (dBA)	Lp(A) w/o Barrier (dBA)	Lp(A) (Mitigated) (dBA)
Control	77.1	585	618	338	0	338	0	0.0	Line of Sight	0	55	55
Process Area	55.5	585	618	354	0	354	0	0.0	Line of Sight	0	32	32
Dewatering/Equipment	50.0	585	618	300	0	300	0	0.0	Line of Sight	0	28	28
										Combined Sound Leve	55	55

Receiver	Eastern Property Boundary (E1)											
Equipment	Lp at 25' (dBA)	Receiver Elevation	Source Elevation (feet amsl)	Source to Receiver (feet)	Source to Barrier (feet)	Receiver to Barrier (feet)	Base of Barrier (feet amsl)	Barrier Height	Fresnel No. @ 500 Hz	Noise Abatement (dBA)	Lp(A) w/o Barrier (dBA)	Lp(A) (Mitigated) (dBA)
Control	77.1	695	618	400	0	400	0	0.0	Line of Sight	0	53	53
Process Area	55.5	695	618	351	0	351	0	0.0	Line of Sight	0	33	33
Dewatering/Equipment	50.0	695	618	279	0	279	0	0.0	Line of Sight	0	29	29
										Combined Sound Leve	53	53

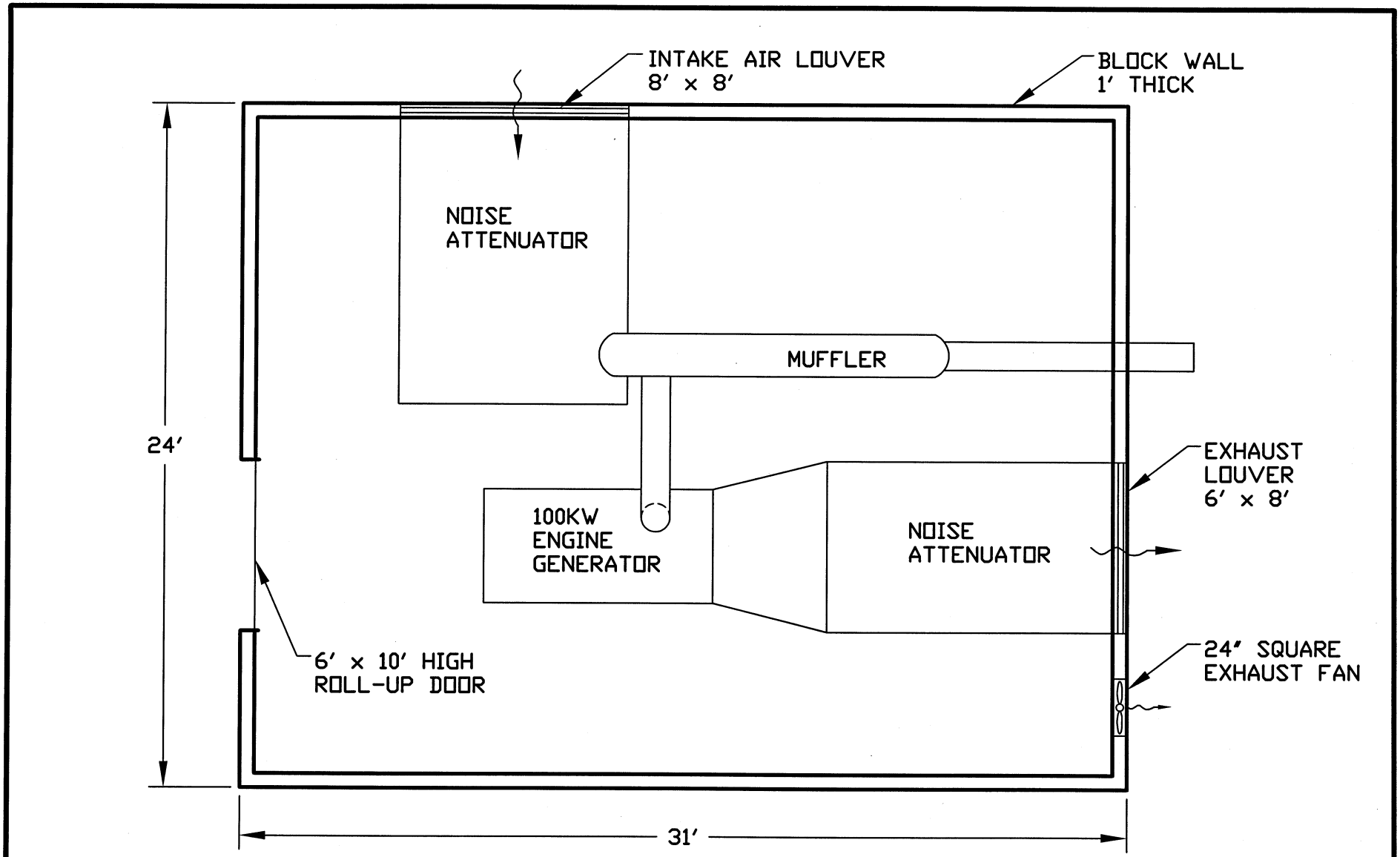
Receiver	Western Property Boundary (W1,2)											
Equipment	Lp at 25' (dBA)	Receiver Elevation	Source Elevation (feet amsl)	Source to Receiver (feet)	Source to Barrier (feet)	Receiver to Barrier (feet)	Base of Barrier (feet amsl)	Barrier Height	Fresnel No. @ 500 Hz	Noise Abatement (dBA)	Lp(A) w/o Barrier (dBA)	Lp(A) (Mitigated) (dBA)
Control	77.1	600	618	157	0	157	0	0.0	Line of Sight	0	61	61
Process Area	55.5	600	618	224	0	224	0	0.0	Line of Sight	0	36	36
Dewatering/Equipment	50.0	600	618	268	0	268	0	0.0	Line of Sight	0	29	29
										Combined Sound Leve	61	61

Receiver	Northern Property Boundary (N1)											
Equipment	Lp at 25' (dBA)	Receiver Elevation	Source Elevation (feet amsl)	Source to Receiver (feet)	Source to Barrier (feet)	Receiver to Barrier (feet)	Base of Barrier (feet amsl)	Barrier Height	Fresnel No. @ 500 Hz	Noise Abatement (dBA)	Lp(A) w/o Barrier (dBA)	Lp(A) (Mitigated) (dBA)
Control	58.1	715	618	217	0	217	0	0.0	Line of Sight	0	39	39
Process Area	55.5	715	618	172	0	172	0	0.0	Line of Sight	0	39	39
Dewatering/Equipment	50.0	715	618	223	0	223	0	0.0	Line of Sight	0	31	31
										Combined Sound Leve	42	42

Receiver	Southern Property Boundary (S1)											
Equipment	Lp at 25' (dBA)	Receiver Elevation	Source Elevation (feet amsl)	Source to Receiver (feet)	Source to Barrier (feet)	Receiver to Barrier (feet)	Base of Barrier (feet amsl)	Barrier Height	Fresnel No. @ 500 Hz	Noise Abatement (dBA)	Lp(A) w/o Barrier (dBA)	Lp(A) (Mitigated) (dBA)
Control	58.1	585	618	338	0	338	0	0.0	Line of Sight	0	35	35
Process Area	55.5	585	618	354	0	354	0	0.0	Line of Sight	0	32	32
Dewatering/Equipment	50.0	585	618	300	0	300	0	0.0	Line of Sight	0	28	28
										Combined Sound Leve	38	38

Receiver	Eastern Property Boundary (E1)											
Equipment	Lp at 25' (dBA)	Receiver Elevation	Source Elevation (feet amsl)	Source to Receiver (feet)	Source to Barrier (feet)	Receiver to Barrier (feet)	Base of Barrier (feet amsl)	Barrier Height	Fresnel No. @ 500 Hz	Noise Abatement (dBA)	Lp(A) w/o Barrier (dBA)	Lp(A) (Mitigated) (dBA)
Control	65.6	695	618	400	0	400	0	0.0	Line of Sight	0	42	42
Process Area	55.5	695	618	351	0	351	0	0.0	Line of Sight	0	33	33
Dewatering/Equipment	50.0	695	618	279	0	279	0	0.0	Line of Sight	0	29	29
										Combined Sound Leve	42	42

Receiver	Western Property Boundary (W1,2)											
Equipment	Lp at 25' (dBA)	Receiver Elevation	Source Elevation (feet amsl)	Source to Receiver (feet)	Source to Barrier (feet)	Receiver to Barrier (feet)	Base of Barrier (feet amsl)	Barrier Height	Fresnel No. @ 500 Hz	Noise Abatement (dBA)	Lp(A) w/o Barrier (dBA)	Lp(A) (Mitigated) (dBA)
Control	57.4	600	618	157	0	157	0	0.0	Line of Sight	0	41	41
Process Area	55.5	600	618	224	0	224	0	0.0	Line of Sight	0	36	36
Dewatering/Equipment	50.0	600	618	268	0	268	0	0.0	Line of Sight	0	29	29
										Combined Sound Leve	43	43



ROOF: 6" THICK CONCRETE SLAB.

HARMONY GROVE PUMP STATION GENERATOR BUILDING

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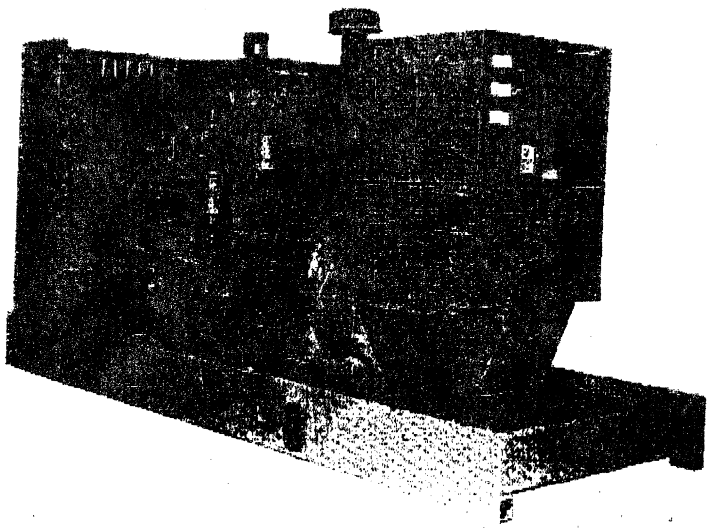
Pump Station

Onan

100 DGDB 60 Hz
85 DGDB 50 Hz
Diesel-Fueled Generator Set

	STANDBY	PRIME
60 Hz	100 kW	90 kW
	125 kVA	113 kVA
50 Hz	85 kW	77 kW
	106 kVA	96 kVA



COPY

Generator Set Features

- Single-source design, manufacturing and testing of all set components and accessories by Onan Corporation.
- Accepts 100% of nameplate kW rating in one step, in compliance with NFPA 110, Paragraph 5-13.2.6.
- Engine torque-matched excitation system provides quick recovery from transient speed dips.
- Low reactance generator design offers low waveform distortion with non-linear loads and provides excellent motor starting capabilities.

Standard Equipment

ENGINE
Cummins 4-cycle diesel engine.

ALTERNATOR
Brushless Onan AC alternator provides broad range reconnectible output. Designed for service in severe environments.

CONTROL PANEL
Vibration isolated control with analog instrumentation.

VOLTAGE REGULATOR
Electronic voltage regulator provides precise regulation and underfrequency compensation.

COOLING SYSTEM
High ambient 122° F (50° C) system.

SKID BASE
Supports the alternator and engine. Battery rack and cooling system mount to the skid base. Integral vibration isolation.

Generator Set Testing

The Prototype Test Support (PTS) program is our commitment to verifying the integrity of our designs and products.

Before the generator sets are put into production, prototype models are subjected to demanding tests with typical/atypical loads and transients anticipated in service.

Production models earn the PTS seal only after meeting the performance criteria established by the program.

Single-Source Warranty

All generator set components and systems are covered by a limited one-year warranty. Optional two- and five-year extended programs are available.

Standard Models are CSA certified.

Power Generation

Sound Data

100DGDB 60 Hz

Sound Pressure Levels @ 7 meters dB(A)

Configuration		Position (Note 1)								8 Position Average
		1	2	3	4	5	6	7	8	
Standard - Unhoused (Note 3)	Infinite Exhaust	82.1	86.4	85.5	85.4	82.0	85.3	84.7	85.1	84.6
F182 - Weather (Note 3)	Infinite Exhaust	84.1	86.8	85.2	85.3	79.5	83.8	84.8	85.8	84.4
F182 - Weather	Mounted Muffler	85.3	87.9	85.9	85.6	80.8	85.3	86.1	87.5	85.6
F172 - Quiet Site II First Stage	Mounted Muffler	85.2	83.1	74.6	72.8	68.8	70.7	73.5	83.9	76.6
F173 - Quiet Site II Second Stage	Mounted Muffler	67.8	71.1	71.9	71.6	67.3	68.8	68.2	70.9	69.6

Note:

1. Position 1 faces the engine front at 23 feet (7 m) from the center of the generator set. The positions proceed around the generator set in a counter-clockwise direction in 45° increments.
2. Data based on full rated load with standard radiator-fan package.
3. Sound data for generator set with infinite exhaust do not include exhaust noise.
4. Sound pressure levels per ANSI S1.13-1971 as applicable.
5. Reference sound pressure is 20 µPa.
6. Sound pressure levels are subject to instrumentation, measurement, installation and generator set variability.

Sound Power Levels dB(A)

Configuration		Octave Band Center Frequency (Hz)								Sound Power Level
		63	125	250	500	1000	2000	4000	8000	
Standard - Unhoused (Note 3)	Infinite Exhaust	71.2	85.3	96.4	99.9	105.1	105.0	101.5	96.5	109.9
F182 - Weather	Mounted Muffler	87.7	99.5	99.7	103.9	106.9	106.7	102.3	97.9	112.1
F172 - Quiet SIte II First Stage	Mounted Muffler	76.5	90.7	93.5	99.8	102.6	102.8	99.0	91.5	107.8
F173 - Quiet SIte II Second Stage	Mounted Muffler	75.1	90.4	89.8	90.2	92.0	90.3	87.3	87.3	98.2

Note:

1. Data based on full rated load with standard radiator-fan package.
2. Sound power per ANSI S12.34-1988 and ISO 3744 as applicable.
3. Sound data for generator set with infinite exhaust do not include exhaust noise.
4. Reference sound power is 1pW=1 x 10^{-12} W.
5. Sound power levels are subject to instrumentation, measurement, installation and generator set variability.

Hz	63	125	250	500	1000	2000	4000	8000				English	
Lwa	71	85	96	100	105	105	102	97	110		Q	2	
Lw	97	101	105	103	105	104	101	98	112		r	3	ft
	-6	-6	-6	-6	-6	-6	-6	-6		Q,r,al,S	Alpha	0.15	
Lp in Room	91	95	99	97	99	98	95	92	106		S	2808	ft2
Lw of louver	2	2	2	2	2	2	2	2		A,	Louver A	64	ft2
Lw at Louver	93	97	101	99	101	100	97	94	108				
Lp (Exterior)	78	82	86	84	86	85	82	79	93	R,	R	10	ft
Q, Outside	6	6	6	6	6	6	6	6			Q(outside)	4	
A-Weighting	-26	-16	-9	-3	0	1	1	-1					
LpA (Exterior)	52	66	78	81	86	87	83	78	91				
Louver Attenuation	-9	-7	-10	-14	-22	-24	-23	-22		C/S Model A-12350			
LpA with louver (Exterior)	43	59	68	67	64	63	60	56	73				
	-22	-31	-47	-53	-54	-43	-26	-17		IAC Model 10LFS			
	21	28	21	14	10	20	34	39	41				
								Room					
								x	31	ft			
								y	24	ft			
								z	12	ft			
								S=	2808	ft2			

Intake Louver

	Calculates Noise Level from duct to outside												
Frequency	Hz	63	125	250	500	1000	2000	4000	8000				
Sound Power	Lw	97	101	105	103	105	104	101	98	112	Lw (Onan 100DGDB)		
Duct Length Adjustment		0	0	0	0	0	0	0	0				
In Duct Sound Power	Lw of louver	0	0	0	0	0	0	0	0		A,	Louver A	48 ft2
Surface Directivity	Q											Q	4
Distance Adjustment		-14.6518	-14.6518	-14.6518	-14.6518	-14.6518	-14.6518	-14.6518	-14.6518			R	10 ft
A-Weighting		-26	-16	-9	-3	0	1	1	-1				
		57	71	82	86	91	91	88	83	96			
Louver Attenuation		-22	-31	-47	-53	-54	-43	-26	-17		IAC Model 10LFS		
LpA with louver (Exterior)		35	40	35	33	37	48	62	66	67			
		-9	-7	-10	-14	-22	-24	-23	-22		C/S Model A-12350		
		26	33	25	19	15	24	39	44	45			

exhaust louver

Hz	63	125	250	500	1000	2000	4000	8000				English	
Lwa	71	85	96	100	105	105	102	97	110		Q	2	
Lw	97	101	105	103	105	104	101	98	112		r	3	ft
	-6	-6	-6	-6	-6	-6	-6	-6		Q,r,al,S	Alpha	0.15	
Lp in Room	91	95	99	97	99	98	95	92	106		S	2808	ft2
Lw of louver	-10	-10	-10	-10	-10	-10	-10	-10		A,	Louver A	4	ft2
Lw at Louver	81	85	89	87	89	88	85	82	96				
Lp (Exterior)	66	70	74	72	74	73	70	67	81	R,	R	10	ft
Q, Outside	6	6	6	6	6	6	6	6			Q(outside)	4	
A-Weighting	-26	-16	-9	-3	0	1	1	-1					
LpA (Exterior)	40	54	66	69	74	75	71	66	79				
LpA with louver (Exterior)	40	54	66	69	74	75	71	66	79				
Sound Attenuator	-5	-10	-17	-28	-36	-34	-23	-16		IAC Model 3ES			
	35	44	49	41	38	41	48	50	55				
								Room					
								x	31	ft			
								y	24	ft			
								z	12	ft			

ATTACHMENT 4

WORST-CASE BLASTING/DRILLING NOISE

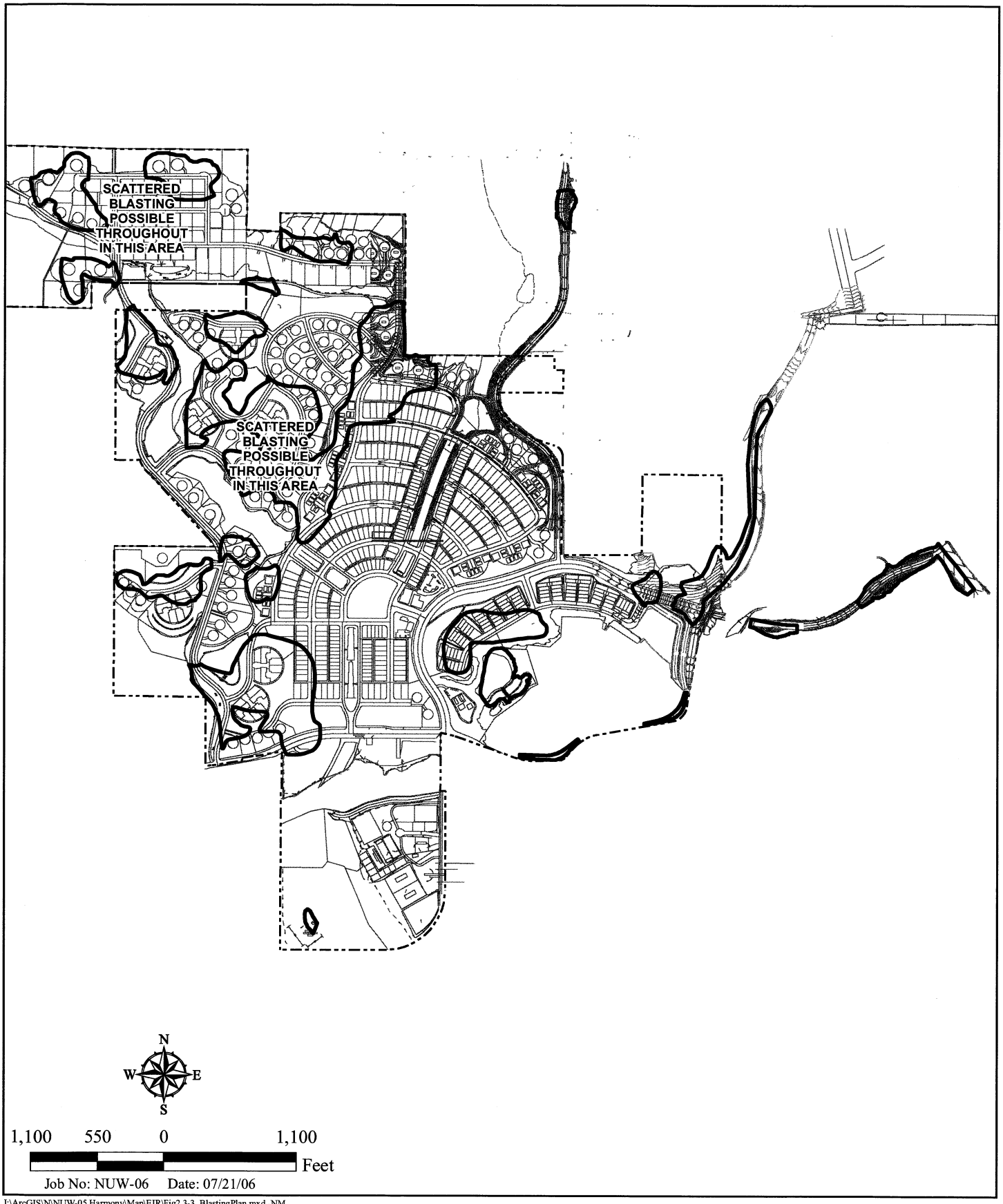
Blasting and Drilling Source Noise Levels (A-Weighted)

Drill L_{max} = 98 dB at 50 feet.
Blast L_{max} = 94 dB at 50 feet. For a blast L_{max} is approximately equal to SEL.
$Leq_{(1)}$ = SEL + 10 log N - 10 log (t). For 1-hour t = 3600 seconds
Blast $Leq_{(1)}$ = [94 +10 log 2 -10 log (3600)] = 61.4 dB (Assumes two blasts per hour).

Drilling + Blasting Noise $Leq_{(1)}$ 98 + 61.4 = 98 dB at 50 feet
84dB $Leq_{(1)}$ at 250 feet
(Assumes drilling lasts one-hour at maximum noise level and two blasts per hour).

Barrier Attenuation Calculation for Drilling Equipment
(Assume drill rig generates 89 at 50 feet)
Source to Barrier = 20 feet
Barrier to Receiver = 30 feet
Source Elevation = 10 feet for source height
Receiver Elevation = 5 feet for receiver height

Barrier Height	Barrier Attenuation	Mitigated A-weighted Noise Level
14 feet	14 dB	89 dB -14 dB = 75 dB $Leq_{(1)}$
12 feet	11 dB	89 dB - 11 dB = 78 dB $Leq_{(1)}$
10 feet	7 dB	89 dB - 7 dB = 82 dB $Leq_{(1)}$
8 feet	0 dB	89 dB - 0 dB = 89 dB $Leq_{(1)}$



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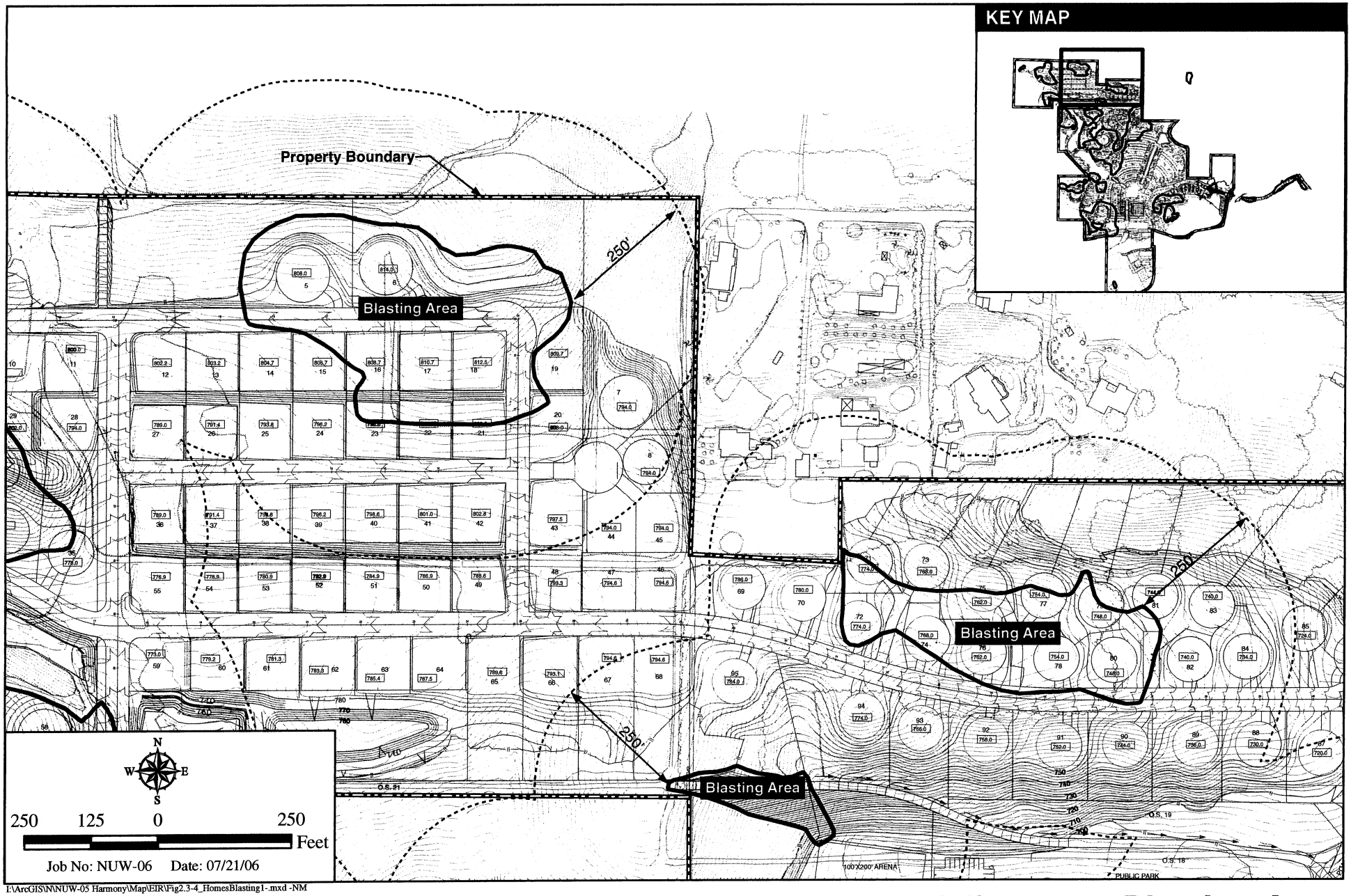
Blasting Plan

HARMONY GROVE VILLAGE

HELIX



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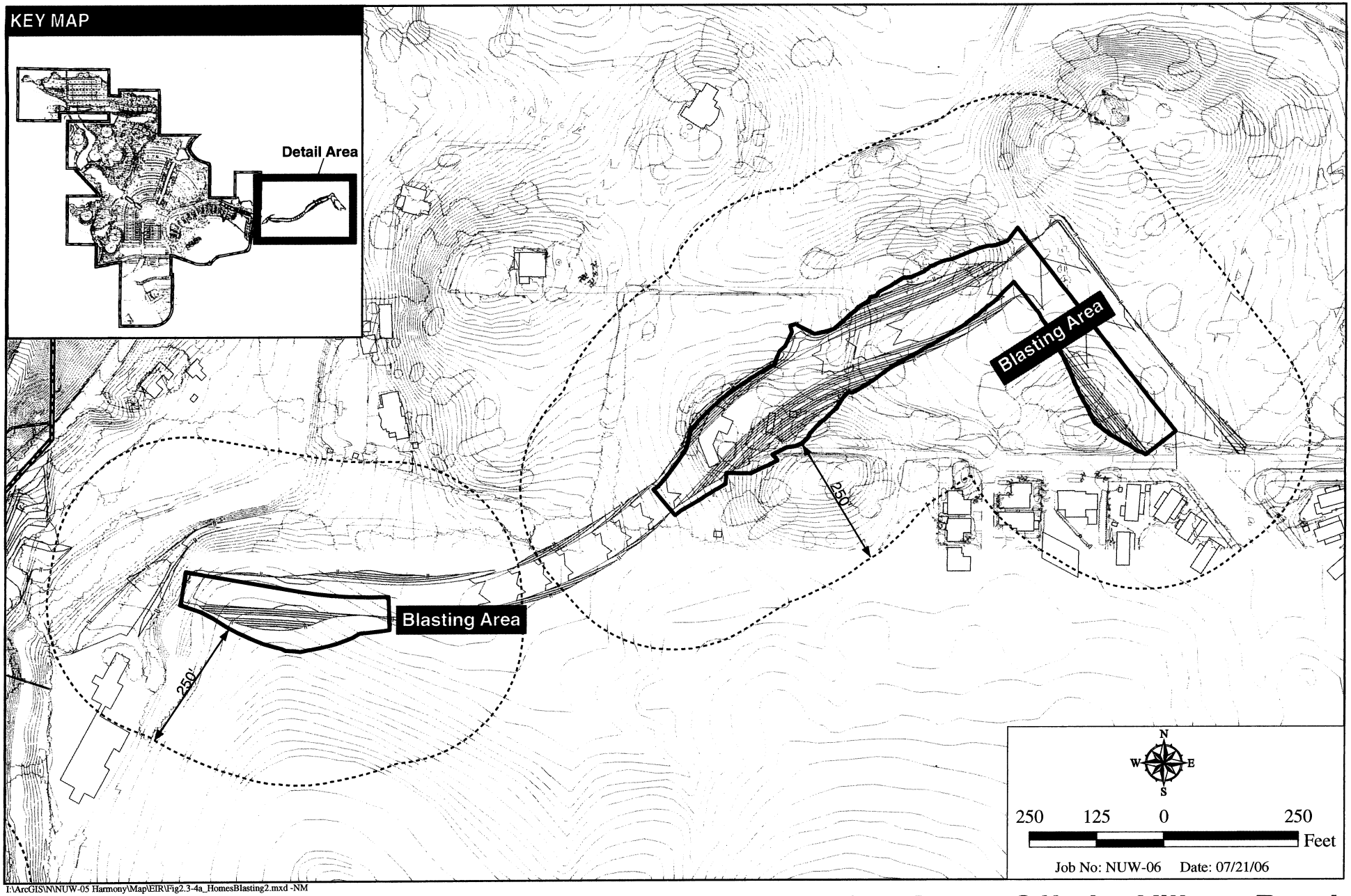
Location of Existing Homes Adjacent to Blasting Area

HARMONY GROVE VILLAGE

HELIX

Figure 6A



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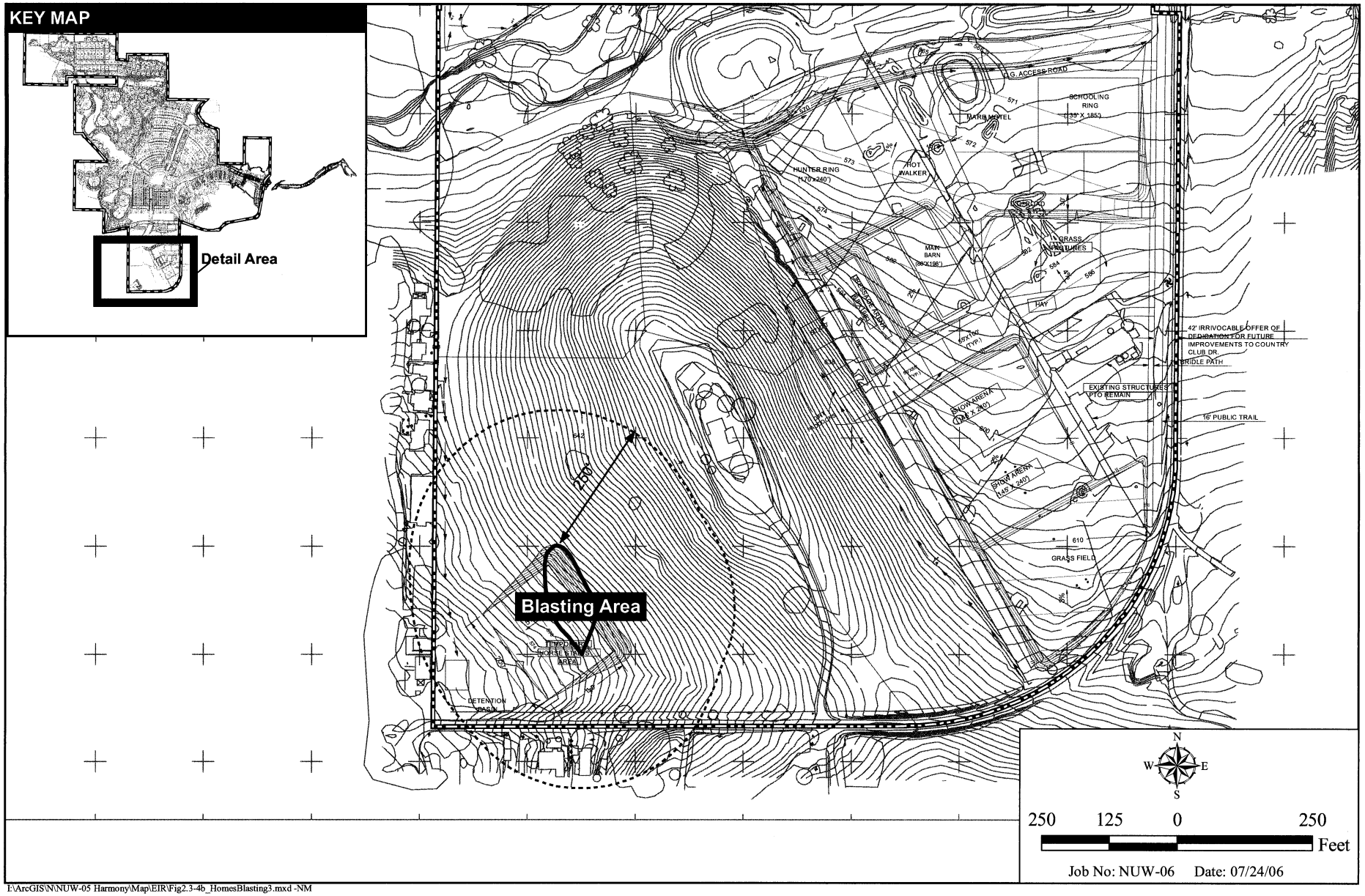
Location of Existing Homes Adjacent to Blasting Area - Off-site Village Road

HARMONY GROVE VILLAGE

HELIX

Figure 6B



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Location of Existing Homes Adjacent to Blasting Area

HARMONY GROVE VILLAGE

HELIX

Figure 6C

ATTACHMENT 5

AVENIDA DEL DIABLO TRAFFIC OPTIONS

Table A-5a
Off-Site Traffic Volume Noise Level Increase
(Existing Plus Project)

Street (Segment)	Existing ADT	Existing + Project ADT (Option 1)	Existing + Project ADT (Option 2)	Existing + Project ADT (Option 3)	CNEL Difference[1] (dB) (Option 1)	CNEL Differnce[1] (dB) (Option 2)	CNEL Difference[1] (dB) (Option 3)
Avenida Del Diablo							
Citracado Pkwy. to Hale Ave.	2,700	0	8,100	5,570	-	**5[2]**	3
Hale Ave. to Valley Pkwy.	1,100	3,800	1,000	2,900	**5[2]**	0	4
Citracado Parkway							
Avenida Del Diablo to Valley Pkwy.	2,400	13,220	10,580	9,430	**7[2]**	**6[2]**	**6[2]**

Notes:

[1]Existing vs. existing plus project

Bold[2] = exceeds City of Escondido's 5 dB significance threshold

All values are rounded to the nearest dB

Baseline traffic volumes include redistributed existing traffic. Therefore, baseline volumes are not always existing traffic volumes.

Table A-5b
Off-Site Traffic Volume Noise Level Increase
(Existing Plus Project Plus Cumulative)

Street (Segment)	Existing ADT	Existing + Project + Cumulative ADT (Option 1)	Existing + Project + Cumulative ADT (Option 2)	Existing + Project + Cumulative ADT (Option 3)	CNEL Difference[1] (dB) (Option 1)	CNEL Differnce[1] (dB) (Option 2)	CNEL Difference[1] (dB) (Option 3)
Avenida Del Diablo							
Citracado Pkwy. to Hale Ave.	2,700	0	8,700	5,800	-	**5[2]**	3
Hale Ave. to Valley Pkwy.	1,100	4,400	1,000	3,200	**6[2]**	0	**5[2]**
Citracado Parkway							
Avenida Del Diablo to Valley Pkwy.	2,400	14,100	11,420	10,170	**8[2]**	**7[2]**	**6[2]**

Notes:

[1]Existing vs. existing plus project plus cumulative

Bold[2] = exceeds City of Escondido's 5 dB significance threshold

All values are rounded to the nearest dB

Baseline traffic volumes include redistributed existing traffic. Therefore, baseline volumes are not always existing traffic volumes.